



ANNUAL REPORTS
OF THE
FRUIT GROWERS' ASSOCIATION
AND
FRUIT EXPERIMENT STATIONS
OF ONTARIO

1903

THIRTY-FIFTH ANNUAL REPORT
OF THE
FRUIT GROWERS' ASSOCIATION
OF ONTARIO
1903

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE.)

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Fruit Growers' Association of Ontario.

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COMMITTEES.

Executive : PRESIDENT, VICE-PRESIDENT and SECRETARY.

Board of Control Fruit Experiment Stations : Elected by the Association : A. M. SMITH, ELMER LICK, W. T. MACOUN ; (ex-officio) : G. C. CREELMAN, Chairman ; PROF. H. L. HUTT, P. W. HODGETTS.

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Fruit Growers' Association of Ontario

ANNUAL MEETING.

The annual meeting was held in the Town Hall, Leamington, on Tuesday afternoon, November 24. The chair was taken by the President, Mr. W. H. Bunting, at 2.30 p.m. o'clock.

REPORT OF THE EXECUTIVE.

By G. C. Creelman, Secretary, Toronto.

In presenting this, my second annual report as Secretary of the Ontario Fruit Growers' Association, I wish to thank the Directors for the support which they have given me in carrying out the details of the work of the Association. Where the members of the Board are located in so many different points of the Province, and where the fruit interests of the different localities are not the same, it is not practicable for the Board to deal with other than general questions. The detailed work of the Association has to be done by the Executive Committee, or by the Secretary dealing directly by correspondence or otherwise with the individual members of the Board.

On the whole, I feel that we can report progress, and I have divided my report into sub-heads, that you may see exactly what has been accomplished in the different departments of our work.

(1) Local Fruit Growers' Associations.

In my report last year, we made note of the fact that a number of Local Fruit Growers Associations had been organized throughout the Province, under the direction of the Executive Committee. At the time of organization, experts were sent to the different localities to give instruction on orchard management. The object of these local organizations was stated to be, "to assist the farmers to produce more and better fruit." We realize now that this was not broad enough. In many instances more fruit was produced than could be profitably handled. I think, therefore, the time is ripe, taking these local organizations as a nucleus, to organize associations for the purpose of buying and selling; buying packages, spraying materials, etc., and the selling to the best advantage all of the products of the garden and orchard. In the Georgian Bay district the idea of buying was put into practical effect last year, while this year we have the splendid example in the Lake Huron district of what might be accomplished in the way of disposing of our fruit by co-operative storing and selling. The following report from Mr. A. E. Sherrington will give you an idea of the work being done and the advantages derived from co-operation:

This Association was organized in the month of March, 1902, with a membership of twenty-four, under the auspices of the Fruit Growers' Association, and by direction of the Secretary, Mr. G. C. Creelman. The rules, as laid down by the Association as a guide for Local Associations, were adopted, and have been carried out as closely as it was possible to do so. The Association met monthly, and at these meetings the different subjects regarding fruit growing and co-operative work in connection with it were discussed. Untold good has been done along these lines, and it has caused a great deal more interest to be taken in the cultivation and care of the orchard.

A new set of rules and by-laws is now being prepared, and incorporation applied for. I should like to mention the rule governing packing. Each member must pack and grade his own fruit, placing his name on each package with either stencil or rubber stamp, and stating the variety and grade of fruit. In this way every member becomes responsible for his pack. In 1892 the Association made their first trial in the co-operative

work by putting up two cars of Duchess apples made up of 1,000 boxes and 100 barrels. These were sold f.o.b., but forwarded to Manchester, England, and arrived in good condition. In addition to these, three cars of winter apples were packed and sold. This year the Association has prospered beyond all expectations. We now have between fifty and sixty members, and shall go in for co-operation in the shipping of apples. Up to the present time the Association has shipped fourteen car loads.

Advantages of Co-operation.

(1) We believe that the grower is the proper party to grade and pack his own fruit. By so doing he receives better prices, and better prices mean more money, and more money means more interest being taken in the care of the orchard and fruit.

(2) By co-operation apples were not left lying on the ground waiting for the packers to come and scramble over the piles for a few of the best specimens, and wasting the rest, but are packed as gathered from the trees, thereby saving a larger percentage of the fruit.

(3) Another advantage in co-operation is in the handling of early apples, as all the members can commence picking and packing the same day. In this way, only two or three days will be required to make up a car, and the fruit will be got away in a fresher and better condition than by the other way of selling to the buyers.

(4) By co-operation money can be saved by purchasing packages in large quantities.

(5) There are no middlemen to pocket the larger share of the profits.

(6) By co-operation, better shipping facilities and lower rates may be obtained.

(7) By co-operation more interest is taken in the markets and more intelligence applied to the business.

(8) Co-operation not only increases the profits, but induces the members to take a deeper interest in the production of a better quality of goods, and the putting of them on the markets in a better condition. The consumer, also, in buying the goods will have a more friendly feeling for, and will take more interest in the producer, as a closer relationship will be established.

(9) As to the possibilities of co-operation, it is impossible to tell what the outcome will be, but in my opinion it is bound to grow and become a power in the country. In the case of the Lake Huron Fruit Growers' Association, the next move will be to build a store house where packages may be stored ready for use, and where they may be returned when filled and kept until the cars are made up. I have no doubt that in a short time other farm products will be added to the list of co-operative shipments, such as butter, eggs, and poultry. These products can all be handled by co-operation.

(2) Orchard Meetings.

Meetings in the orchard having proven most successful in 1902, it was decided to continue the work during the present year, and to this effect the following letter was mailed to each of the local organizations, and to such other points in the different parts of Ontario as recommended by individual members of the board :

"Toronto, Feb. 23, 1903.

"Dear Sir,—Following the practice of last year, the Ontario Fruit Growers' Association has decided to hold a series of orchard meetings to demonstrate the pruning and management of orchard trees. Through the kindness of the Dominion Department of Agriculture, we have been able to secure the services of some of the Fruit Inspectors, including Messrs. McNeill, Carey and Lick. These gentlemen will be available from the 9th till the 27th of March, and are prepared to give a practical demonstration in pruning, together with a talk leading to a general discussion on orchard cultivation and management, and matters generally pertaining to the fruit business.

"The idea is to assemble at a meeting-place at 1.30 p.m. for an hour's discussion on fruit matters. An adjournment will then be made to the orchard selected for the demonstration. In the evening another meeting will be held for the purpose of organizing a local Fruit Growers' Association, or where already organized, to continue the good work.

"Please let me know at once whether you desire any of these meetings, and at what places you wish to hold the demonstrations. The circuits will have to be arranged before the close of next week, so that it will be necessary for you to reply promptly to secure the services of these gentlemen."

After having heard from the different points where it was thought advisable to have meetings, we took the matter up with the Farmers' Institutes in each district, and secured their co-operation, good-will and financial support to the benefit of all concerned. The following is a copy of the letter mailed to the Institute Secretaries at that time :

"Toronto, March 9, 1903.

"Dear Sir,—I am pleased to announce to you that we have arranged to hold Fruit Institute Meetings in your district this spring. The Ontario Fruit Growers' Association, at its last meeting, decided to again co-operate with the Farmers' Institutes, and, as far as possible, hold meetings to assist the local fruit growers in their work. The meetings in your district will be held at, and the speakers will be

"I shall expect you to advertise the meetings, arrange for halls, and pay for the same out of the Farmers' Institute funds, as it will be largely your members who will receive the benefit at this time. The speakers will not cost you anything. I will write a personal letter to each of your members in your district, naming the place of meeting and the date, and I would like you to bill the district as far as possible, so as to secure a good meeting. The idea is to call the meeting as usual at 1.30, and at 3.30 to adjourn to a local orchard for a practical demonstration in pruning, grafting, etc. In the evening a general meeting will be held for discussion and organization. You will please arrange with some one near the hall for the use of his orchard.

"I would like you to look after this matter personally, but if you find you cannot do so, please appoint one of your directors, or a member who is particularly interested in fruit, to act for you."

While we realize that the officers of the Local Fruit Growers' Associations, and the officers of the Farmers' Institutes must be held largely responsible for the meetings, I have found that a personal letter to the farmers themselves will often bring them to the meetings, where they would pay no attention to an invitation from a local man. To this end the following personal letter was sent to every farmer whose name could be secured in the neighborhood :

"Toronto, March 13, 1903.

"Dear Sir,—At the last Annual Meeting of the Ontario Fruit Growers' Association the Secretary was requested to arrange a series of Orchard Institute meetings, particularly through the apple districts of the Province of Ontario. Since the beginning of the year the Secretary has been corresponding with fruit growers throughout the Province in reference to the best places to hold these meetings, and has finally arranged the following schedule. It is intended, as far as possible, to hold a short meeting in the hall in the afternoon at 1.30, and at 3.30 the meeting will adjourn to a neighboring orchard, where a practical demonstration will be given in pruning, grafting, etc., as well as a talk on orchard cultivation and methods generally pertaining to fruit growing.

"It is expected that the members of the Farmers' Institutes and Horticultural Societies, as well as every farmer interested in the production of fruit, will be present and receive instruction and take part in the discussion.

"In the evening a general meeting will be held for the purpose of organizing a local Fruit Growers' Association. The object of these associations shall be to foster the fruit industry. Such organizations already formed have done good work in discussing methods of cultivation, and picking, packing, grading and handling of fruit, co-operative shipping, co-operative buying of packages, etc."

An Illustration.

To give you an idea of what takes place at these meetings, I take the liberty of quoting here from the report of Mr. G. C. Caston, some of the questions asked and the answers given at the orchard meetings attended by him :

Q. What is the main object to be aimed at in pruning ?

A. First, symmetry of the tree, and if the orchard is to be cultivated, which it certainly should be, remove all branches that are inclined to droop, and keep trees well headed up ; second, to keep the top open enough to allow of a free circulation of air and sunshine through the branches ; third, an even distribution of the bearing wood (fruit spurs) all over the tree.

Q. What are the common errors in pruning ?

A Allowing the tree to grow for years without any training at all, and then slashing and butchering it unmercifully. To open it up, they cut several large limbs out of the head, leaving the top of the tree shaped like a vase, and the hot sun in mid-summer blisters the bark on the exposed branches. Then the remaining limbs are stripped of everything except a wisp on the end, only about the last two years' wood. The fruit spurs are nearly all gone, and the result is a big crop of suckers, and the usefulness of the tree is to a great extent destroyed.

Some trees of a spreading open habit of growth require very little pruning, while others, as for instance the Spy and Russet, require considerable, but it should be a thinning out of the small branches, rather than a cutting and a slashing of the large limbs.

No man should attempt to prune without a stepladder, and most of the work should be done from the ladder in thinning out the small branches around the outside. A man should never attempt to prune a fruit tree who does not know a fruit bud from a leaf bud, and who does not recognize the fruit spurs, for in pruning the fruit, spurs should be left evenly distributed over the tree. In some varieties that have the habit of setting more fruit than the tree can properly mature, a judicious thinning out of the fruit spurs is required. Then the tree will bear fruit of a marketable quality, where otherwise it would be too small. In other trees that are shy bearers, the average pruner cuts them away where they should be encouraged and developed. And here is where the pruner should understand his business. Many people's idea of pruning is simply to cut limbs out of a tree until it looks to be pretty well thinned out. They seem to have no method in their work and they do not work intelligently.

Q. Do you cut close?

A. Yes, cut close and smooth and never leave any stubs, and if obliged to cut any limbs over an inch in diameter, paint the wound well as soon as it gets dry.

Q. When is the best time to prune fruit trees?

A. The month of June is the best time.

Q. Why is that the best time?

A. Because wood growth is going on then. The formation of new wood tissue is most active then, and the wound immediately begins to heal around the edges. If the wound is made in the fall or winter, or too early in the spring, the delicate cambium around the edge is weather-beaten and injured, and does not heal so readily as if cut in the growing season.

Q. But, if you cannot do it in June? It is a most difficult matter for most people to attend to it at that time, owing to the press of work.

A. Well, the next best thing is to do it as near that time as possible. Under no circumstances should it be done in the fall or winter. This is decidedly bad practice.

Q. What effect has pruning upon bearing?

A. Where trees are making rapid wood growth anything that will check the growth has a tendency to the production of fruit buds. A moderate pruning will often have this effect. But if it is overdone you will get a crop of suckers instead. The proper course is to prune regularly and keep the tree in proper shape, and if there is too much wood growth where there ought to be fruit, use a fertilizer with a large percentage of potash and phosphoric acid and less nitrogen, such as hardwood ashes.

Q. Do you consider hardwood ashes a good fertilizer for the orchard?

A. Yes, decidedly. You cannot get potash and phosphoric acid as cheap in any commercial fertilizer, and it is a great mistake to allow them to be shipped out of the country to be used by fruit growers in the United States, when many of our own orchards are starving for need of them. I believe the production of first-class fruit, is, after all, a matter of fertility more than anything else, although pruning, spraying, and cultivation are all very important and must be attended to.

Q. What quantity of ashes would be a good dressing for an orchard?

A. That depends somewhat upon the character of the soil. Clay or clay loam soil is not so likely to need potash as sandy soil. If sandy or sandy loam, you are not likely to overdo it in the matter of potash. Forty bushels to the acre every second

year would do, and I might add, a crop of clover plowed in between times. This would be vastly better treatment than most of our orchards receive.

Q. What are ashes worth per bushel for orchard purposes?

A. Buy them as cheap as you can, but unleached hardwood ashes are worth 20 or 25 cents per bushel for fertilizing orchards, and that is cheaper than commercial fertilizers. Even leached ashes are worth the hauling if you can get them, for there is still a percentage of potash in them, and the phosphoric acid is not removed by leaching.

Q. When is the best time to apply them?

A. In the fall.

Q. When should scions be cut for grafting?

A. When the wood is dormant late in the fall, or early in the spring. They should not be cut when the wood is frozen.

Q. How should they be kept?

A. In sawdust. There is nothing better. It keeps them cool and moist.

Q. When should grafting be done?

A. As soon as the sap begins to circulate and the growth begins, but if the scions are cut at the right time and kept dormant you can graft successfully until the leaf is half out. However, the earliest ones usually do the best.

Q. What is the proper formula for grafting wax?

A. About five ounces of tallow, eight ounces of beeswax, and one pound of resin. Melt over a slow fire. Do not allow it to boil, but simply to melt thoroughly, stir and pour into cold water, and pull it until it is nearly white.

Q. In top-grafting, would you work the whole top over at once?

A. No, you must not do that, you might kill the tree. You must keep up a balance. Take about one-third at a time, and work the new top on gradually. In this way you do not check the growth, or disturb the balance between top and roots too much.

Q. Do you consider top-grafting to be a good practice?

A. Yes, most decidedly. It is the best way to grow our best commercial apples.

Q. What do you consider the best stock for grafting on?

A. Something hardy. There are many varieties that do very well, and they are classed as Ironclads; but I consider the Talman Sweet one of the very best for that purpose. There is nothing better that I know of.

Q. What do you consider the best varieties for the commercial orchard?

A. Spy, Baldwin, King, Greening, Wagner, Snow, Blenheim, Pippin, and perhaps a few Ben Davis. That would be a pretty fair list. It is a great mistake to have too many varieties. Most of these varieties should be top-grafted. In fact, all except the Snow and Blenheim.

Q. When is the proper time to spray?

A. The first time on the bare trees, with copper sulphate, 2 lbs. in 40 gals. of water. Then again just before the blossoms open, with bordeaux mixture, 4 lbs. blue-stone, 4 lbs. lime in 40 gals. of water. If there are tent caterpillars or any leaf-eating insects, this is the time to dose them, and add eight ounces of Paris green to the mixture if these insects are plentiful. There will be no damage to the foliage if plenty of lime is used.

Q. Should the lime be fresh?

A. Yes, as fresh as you can get it. I always use the cyanide test, and would advise everyone else to do the same.

Q. What is the test?

A. Get about five cents worth of ferro-cyanide of potassium and dissolve it in a half-pint of water. When the bordeaux mixture is made stir it well and drop a few drops of the cyanide solution in it. If it turns purple on striking the mixture add more lime until it will give no color, and then it is safe to use and will not burn or injure the foliage. More than half the battle in spraying is gained by having a good pump. Never use anything else.

Meetings were held as follows :

Division 1. Delegates : A. E. Sherrington, Walkerton ; P. J. Carey, Fruit Division, Ottawa.

Chesley	March 23	Mildmay	March 30	Clinton	April 6
Tara	" 24	Teeswater	" 31	Goderich	" 7
Port Elgin	" 25	Kincardine	April 1	Hensall	" 8
Tiverton	" 26	Lucknow	" 2	Exeter	" 9
Pinkerton	" 27	Brussels	" 3		
Walkerton	" 28	Blyth	" 4		

Division 2. Delegates : G. C. Caston, Craighurst ; A. McNeill, Fruit Division, Ottawa.

Randolph	March 23	Orillia	March 28	Creemore	April 3
Midhurst	" 24	Oro Station	" 30	Collingwood	" 4
Edgar	" 25	Churchill	" 31	Clarksburg	" 6
Jarratt's Corners	" 26	Stayner	April 1	Meaford	" 7
Rugby	" 27	Creemore	" 2		

Division 3. Delegates : F. J. Barber, Georgetown, March 23-April 2 ; M. Pettit, Winona, April 3-4 ; Harold Jones, Maitland, April 7 ; Elmer Lick, Fruit Division, Ottawa.

Trenton	March 23-24	Bowmanville	March 30	Ancaster	April 4
Wicklow	" 25	Oshawa	" 31	Irena	" 5
Welcome	" 26	Myrtle	April 1	Belleville	" 8
Newcastle	" 27	Pickering	" 2	Frankford	" 9
Orono	" 28	Bronte	" 3		

Division 4. Delegates : W. T. Macoun, Central Experimental Farm, Ottawa ; A. McNeill, Senior Fruit Inspector ; S. S. Cheetham, Dairy Instructor, Ottawa.

Vernon	July 7	Fallowfield	July 8	Metcalf	July 9
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Division 5. Delegates : A. Harkness, Irena ; A. McNeill, Senior Fruit Inspector, Ottawa.

Morrisburg	April 23	Lancaster	April 24	Iroquois	April 7
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As you see, this Association is largely indebted to the Fruit Division of the Dominion Department of Agriculture for speakers and demonstrators. I believe, candidly, that if the Ontario Fruit Growers' Association had done nothing during the year but conduct these meetings, they would not have labored in vain.

(3) The Work of the Fruit Experiment Stations.

We have been endeavoring for some years past to bring the work of the stations into touch with the farmers of the vicinity where such stations are located. We have had Farmers' Institutes hold summer meetings there with good success. So, following this up, we got the consent of the Department to send a copy of the report of the "Fruit Experiment Stations," including a description of the fruits of Ontario, to each member of each Local Fruit Growers' Association and to each farmer living in the vicinity of the stations. At the same time we mailed to each of these persons the following letter, and where names were sent in as a result of it they were also furnished with the report :

"Toronto, June 10, 1903.

"Dear Sir,—The Annual Report of the Fruit Experiment Stations, published by the Department of Agriculture, is now ready for distribution, and we desire your co-operation in helping us to place this very valuable report in the hands of the fruit growers of Ontario. As in former years, there is a continued description of the fruits of Ontario, including the Stark Apple; the Agawam, Minnewaski and Snyder Blackberries; Late Duke and California Advance Cherries; Campbell's Early and Diamond Grapes; Easter Beurre, Hoosac, Pitmaston, Seckel and Triumph Pears; Abundance, Burbank, Bradshaw, Red June and Yellow Egg Plums, and fifteen varieties of Strawberries, each variety in every case splendidly illustrated.

"The experiments also give very full notes for the past season on the varieties under cultivation at their respective stations. A very valuable addition this year is a catalogue of the values of the fruits and fruit trees of Ontario, also showing their adaptability to the various parts of the Province, designed to aid the planters in selecting suitable varieties. This catalogue, first published some years ago, has been thoroughly revised, and should prove of great value to all fruit growers.

"We would ask you to kindly fill in the enclosed blanks, with the names and the addresses of the members of your local Fruit Growers' Association, and of any other fruit men in your vicinity who would be likely to make use of this report."

As a result of this letter, we received the names of 1,047 persons, to each of whom a copy of this report was mailed. Of course, it is impossible to determine the good this educational work is doing. Farmers are reticent about their business. It is an indisputable fact that at Agricultural dinners held in our towns and villages most of the speech-making is done by lawyers, doctors, and other professional men present. The same is true in meetings of Farmers' Institutes. Very often our speakers are almost discouraged and say on returning from an institute campaign, that they do not believe they accomplished any good in certain districts. Later on, however, come letters from farmers who were present at the meetings, asking for fuller information in reference to certain things that were discussed at these meetings. We realize, therefore, that many farmers get information in orchard meetings, through our reports, and at our annual meetings, which they never acknowledge. But what matters it, so long as they put into practice the better methods?

(4) Fruit Exhibits.

At the request of the Executive Committee of the Canadian Association of Fairs and Exhibitions, Mr. T. H. Race, of Mitchell, was invited to address the annual meeting on the subject of "Fruit Display at Our Exhibitions." Mr. Race implored the fair management to take away the barriers from in front of the fruit, and allow the people to see and examine the exhibits. He also asked that someone be present to answer questions about the fruit exhibited, and the adaptability of certain varieties to that particular district, etc. This has had a good effect, as I have noticed this year that many of our fair boards have adopted many of the suggestions brought out at that time. I am pleased to note also the general improvement in the fruit department in many of the prize lists. There is still, however, great room for improvement in this line, and I would suggest that your Executive Committee be instructed to go carefully over the model prize list prepared last year, so that accurate information may be distributed to every fair board in the Province.

Demonstrations in Apple Packing and Grading.

The following report, by Mr. A. McNeill, will show something of the work being done.

At your request I attended nine fall fairs, giving at each a demonstration in apple packing in barrels and boxes. Any want of interest that was noticeable at one or two places could be traced to want of proper advertising, or an unsuitable location, or both. Speaking generally, the interest was all that could be desired, and the arrangements fairly good. There is ample encouragement for extending the work another year.

I took the opportunity afforded me of noting the fruit exhibit generally, and would submit that the time has come for a complete revision of the prize lists and a revolution in the methods of awarding the prizes.

The prizes for fruit and the judging of it at fall fairs should be done with the following objects in view:

- (1) To promote domestic trade.
- (2) To promote the export trade.
- (3) To encourage amateurs.
- (4) To add a decorative feature to the fairs.

These objects are not of equal importance, but all should be kept in mind when framing a prize list. If classes were made to correspond to these several objects, they would undoubtedly overlap, but this would not necessarily cause any confusion, as the classes would be clearly defined. The export class would consist of a very few carefully selected varieties shown on plates, and separate prizes for boxes and barrels of the same variety, taking into consideration the packing and package as well as the fruit. The domestic class would include such varieties as are not included in the export class and yet have been found profitable. Here, again, boxes, baskets and barrels would be in evidence.

These two classes will include all varieties that are deemed worthy of cultivation for commercial purposes, and no others. It may be well, however, to have a third class for amateurs. This would include new fruit and such as is of special value for flavor, color, size or other characteristic, but unsuitable for general planting.

Fruit lends itself so well to decorative effects, that it might not be out of place to offer prizes for collections arranged for the decoration, either of shop window or of an exhibition table.

The classification of apples as "Commercial" and "Amateur" is much better than "Dessert" and "Cooking" or "Summer," "Fall" and "Winter." There seems little reason for offering prizes for "collections" in commercial varieties, except it can be done so as to discourage the growing of a large number of varieties. If "collection" prizes are offered in any class there should be a distinct understanding as to whether any consideration is to be given to the judgment of the exhibitor in the selection of varieties, or other points than the quality of the individual fruits.

It will be noticed that special attention is directed to fruit in packages, whether barrels, boxes, baskets or crates.

In this connection, might I urge the necessity of expert judges in fruit? By this I mean men who have some other qualification than that they can name half a dozen or half a hundred varieties of fruit. We want men of wide experience in growing and selling fruit, and even among such men it is essential that there should be some understanding as to the general principles that underlie fruit judging, and some knowledge of the specific rules that govern their application. It is to be hoped that the Ontario Agricultural College, or the Ontario Fruit Growers' Association will call a conference of fruit men to lay down general principles and provide for instruction classes in fruit judging. Score cards should be constructed and their use insisted on in all cases where the exhibitor asks for it. With proper standards established, there would be a possibility of comparing the fruit at one exhibition with that of another, and it would be possible to send intelligent descriptions by mail—something that cannot be done at present.

I have not suggested varieties in a model prize list. Perhaps the most helpful list of apples and pears is that found in Mr. McKinnon's bulletins on the "Apple Export Trade" and "Pear Export Trade." This is a matter that should receive the attention of the fruit men of the Province.

There should be some supervision in the matter of special prizes, even when the general principles appear to be followed. For instance, a special prize was offered at one of the fairs for the best barrel of Snow apples. In the judgment of the best fruit men the Snow apple can never be shipped to perfection in barrels, and hence to offer a prize for a barrel of Snows is to perpetuate an evil generally recognized in the trade.

All fruits should be named. There is room for much improvement in the methods of doing this. Even when a near view of the fruit is possible, the name is not prominent enough to be easily read.

Only at two fairs of the nine which I visited was it possible to get an intelligent view of the fruit. In all the other places it was fenced off by wire screens or otherwise, in such a way that the educational feature was largely lost. I would also suggest that if a judge is competent he should remain with the fruit during the greater part of the day after the judging is done, so as to give information on all points that may be suggested by the patrons of the fair.

It can serve very little purpose to give prizes that will be carried out of the neighborhood in which the fair is held. The mere looking upon fine specimens of fruit on a table is of no great educational value, unless there is an incentive to make further enquiries about it; and unless the fruit be grown in the neighborhood it is not at all likely that further attention will be given to it. I would, therefore, recommend that fruit that has once taken a prize be so marked, by cutting or otherwise, that it would not again be eligible.

(5) Co-Operation with Town Councils, Local Boards of Trade, Etc.

Last spring we had an application from the Orillia Board of Trade, asking us to visit their town and surrounding country, and to advise them in reference to the best way of co-operating with the farmers in the community, that the average farm might be made more profitable. Accompanied by Mr. A. McNeill, Senior Fruit Inspector of the Dominion Government, your Secretary visited Orillia and the surrounding country, and held several orchard meetings. The result has been to stimulate more inquiry in reference to fruit matters in that district than from any other point in Ontario. I believe that the best citizens of our towns and villages are only too willing to co-operate with the farmers in the matter of buying their supplies and selling their products.

The following is a clipping from the Orillia "Packet," in reference to our work there:

The Fruit Commission Conducting Investigation in this District.

"Messrs. G. C. Creelman, Secretary of the Ontario Fruit Growers' Association, and Mr. A. McNeill, of the Fruit Division, Ottawa, reached Orillia on Tuesday, to conduct an investigation into the fruit industry in this district, at the request of the Board of Trade. They went at once to Mr. C. J. Horn's orchard, which they inspected. They also met and conversed with a number of fruit growers in that vicinity. Among those present were Messrs. R. A. Lehmann, Secretary Farmers' Institute; C. L. Stephens, President of the Horticultural Society; Jesse Ryerson, A. E. Dudenhoffer, John Keenan, Wellington Fisher, and others. The subject most discussed was top-grafting. The consensus of opinion was that the Talman Sweet made the best stock, though Duchess and Gideon were held to be good.

In the evening Messrs. Creelman and McNeill held a conference with a few of the members of the Board of Trade, at which the possibilities of the fruit trade in that district were discussed. The President, Mr. R. O. Smith, presided, and explained that the object of the Board was to assist in developing the fruit industry around Orillia. In the past, it was understood that the farmers had suffered much loss through lack of exact information as to what varieties of apples were adapted to this climate, and it was hoped that the Commission would be able to make recommendations that would prevent such mistakes for the future. The members of the Board had no direct interest in fruit growing, but were simply inspired by a desire to aid in the general prosperity of the district.

Mr. Creelman, in replying, spoke of the great advances that had been made in capturing the British Markets for Canadian products, particularly in the case of cheese and pork. At the present time the Government was bending its efforts towards securing a similar development in the Canadian trade in apples and chickens. The British people were acquiring a taste for Canadian apples, and the object was to furnish them with fruit of good quality and in good condition. They believed the agitation had reached a stage where the only way to advance it further was by going around personally among the farmers and discussing the question with them in their orchards, and this was what they proposed doing around Orillia. The trouble was that every farmer had been running an experiment station of his own, and instead of growing large quantities of standard varieties they were turning out sample lots of all sorts of apples. The thing to do was to decide what varieties were best suited to this district, and then grow them in large quantities, so as to attract buyers. Mr. Creelman ended by saying that he and Mr. McNeill placed themselves at the services of the Board of Trade during their stay here.

Mr. McNeill opened by complimenting the Board of Trade on its enterprise, and expressing pleasure in assisting them in the laudable work. He discussed the fruit question from a dollars and cents standpoint, claiming that an average profit of \$50.00 an acre could be got from an orchard, and that in eight years after planting, lands worth \$50 an acre to begin with, could be advanced to \$500 an acre. He did not wish to anticipate the conclusions he would reach as a result of a more thorough investigation, but

so far as his observation had gone, he believed this district was well suited to apple culture, though he would not recommend the planting of orchards on land that was sandy. He hoped to see the day when one hundred thousand barrels of apples would be shipped out of Orillia—and if they were all of one variety, so much the better. Mr. McNeill discussed varieties, difficulties and suggestions for promoting the fruit industry, in an informal way, with those present. He promised more definite proposals at a later date.

Messrs. Creelman and McNeill visited Rugby and Hawkestone yesterday, meeting some of the fruit growers at Mr. Robert Anderson's, Rugby, in the morning. To-day they will be at Mr. Ben Teskey's, Warminster, in the morning, and at Mr. Matthew Baird's, Jarratt's Corners, in the afternoon. Mr. Creelman returns home to-day, but Mr. McNeill will go across the lake to-morrow (Friday), to meet the fruit growers at Mara. He will be at Mr. Robert Calderwood's, Atherley, at 9 a.m., and will go from there to the orchard of Mr. Geo. McCormick, M.P., in the afternoon, and hopes to meet a number of those interested in the subject and discuss the situation with them. He will visit Ardtrea on Saturday morning, and be at Mr. Jas. Kean's at 9 a.m. This will conclude the investigation for the present.

(6) Fruit Packages.

As a result of the discussion on apple boxes at the Walkerton meeting, quite a number of inquiries were received during the season in reference to this kind of package. On March 19th I received the following letter from Mr. W. A. McKinnon, Chief Fruit Division, Ottawa:

"Ottawa, March 19, 1903.

"Dear Mr. Creelman.—It has been brought to my attention that there is a movement on foot to have certain packages adopted for the export trade in fancy fruit. I see by The Horticulturist that some shippers have adopted a certain size of box for this trade.

"The matter of packages was discussed at the Nova Scotia Fruit Growers' meetings, and has been talked of informally at a number of meetings since. I therefore take this opportunity to impress on you, as Secretary of the Ontario Fruit Growers' Association, the great desirability from the point of view of the British trade (as expressed by great numbers of them to me) of having uniform packages throughout Canada. This uniformity should extend only to the weight of the fruit to be put in the packages. It is in no way harmful, in fact I think it desirable, that each section of the country should have some distinctive mark, either in the shape of the box or in the branding of it, which will serve to identify it in all markets.

"The trade in Great Britain asks for a uniform barrel, preferably one to hold 140 pounds net, of fruit, and for a uniform box, holding 40 pounds net, for apples, and a uniform half case holding 20 pounds net, for pears. If it is possible, by communicating with the various Fruit Growers' Associations, to arrive at an understanding on this matter, I think it would be infinitely better than to let the subject be taken up, and disposed of in different ways by different associations."

I wrote Mr. McKinnon, asking him for his views on the box question, to which he replies as follows:

"Ottawa, April 9, 1903.

"Dear Mr. Creelman,—As requested by you, I send you a memo. of my views with regard to the box question.

"The main essential, as stated by the trade in Great Britain, is that there should be uniformity in the quantity of fruit contained in Canadian packages which are presumably of the same size. The trade asks for a pear half-case containing as nearly as possible 20 lbs. net of fruit; and an apple case or box holding as nearly as possible 4 lbs. net of fruit. It is essential that both of these packages should be of strong material, and should not be flimsy. I should not recommend the use of a box, the ends of which were less than $\frac{5}{8}$ of an inch or the sides less than $\frac{3}{8}$ of an inch, though some have had success with a package the sides of which are only one-quarter inch.

"Now, with regard to the adoption of a standard package by the Ontario Fruit Growers' Association, I do not wish it to be thought that the Fruit Division is meddling with affairs which should be left entirely to the decision of the Association. Please consider any suggestions coming from this office as being intended for the good of the entire Canadian trade. Realizing that the box is going to be more used in the future, I

think it extremely desirable that all the Fruit Growers' Associations in Canada should agree upon the same box for the export trade. As I have written you before, it does not matter if the box varies in shape, in height or length, so long as it may be depended upon to carry always approximately 40 lbs. of fruit. Very little packing material should be used; the trade does not take kindly to the handling of Canadian excel-sior in fruit packages.

"I would suggest that your Association should consult with the other Fruit Growers' Associations, either by correspondence or by the holding of a conference at some central point, which delegates might attend. It is possible that correspondence might be a satisfactory method for dealing with the box question alone, but there are other important problems affecting the entire Dominion, such as the transportation question, and if these subjects were all considered together, it might be well worth the time and expense of a conference. In any case, it would be very regrettable if Nova Scotia, Prince Edward Island, Quebec, Ontario and British Columbia each adopted a distinctive package of its own for the export trade, so that the British purchasers would need to be experts to know just what quantity of fruit they were being offered when a "box" of Canadian apples is offered for sale.

"I am enclosing for your consideration a memo. of the dimensions of various packages already in use. I might add that one of the most prominent growers in Prince Edward Island uses a box wider and shallower than any of the others mentioned, and made of very heavy material. You will observe that there is not, apparently, such a thing as "California package," in the sense of there being one package of the same dimensions used throughout the State."

Commencing an inquiry, we found a great many different sizes of boxes in use, and fruit men differing as to the quantity that should be put into a box. People are pretty well agreed, however, on one of two boxes, either a bushel box, which would go three to the barrel, or a forty pound box, which is four to the barrel.

With the scarcity of barrels this fall the question of boxes has come with more force than ever, and I think some recommendation should be presented by this Association in reference to a uniform box for the whole Province, and if practicable for the whole Dominion of Canada.

(7) Our Annual Report.

Our Annual Report this year was very late in coming from the press. It was prepared and sent down to the King's Printers at the usual time, but, owing to the prolonged session of the Legislature, the printers gave as their excuse that they could not get out the report until the Legislature adjourned and the printing incident to it had been cleared up.

Personally, I am very much pleased with the appearance of the report, both the binding and subject matter. Published in one volume with our own are the reports of the work of the Fruit Experiment Stations, New Fruits of Ontario, and the proceedings of the Entomological Society. In our own report, I wish to call your special attention to the department devoted to the work of the Horticultural Societies, and particularly to the series of articles written by Mr. Hunt, O.A.C., Guelph, divided as it is into the special work of the different months of the year. We were also enabled to use good paper and good cuts for this part of the report.

(8) Horticultural Societies.

Soon after our winter meeting last year, we began the work of helping the Horticultural Societies in our towns and cities. We believe this to be a very important work, and, while this Association has been criticized for having on its Board men who are more directly interested in flowers than fruit, I think that the result of their efforts in the beautifying of our towns has justified their re-election from year to year.

On February 4th the following letter was sent out to our Horticultural Societies:

"Toronto, Feb. 4, 1903.

"Dear Sir,—The past year marks an epoch in the advanced work of our Horticultural Societies. The April meetings were reported to have been the best ever held in the history of many societies. Our lecturers returned well pleased with the reception they met everywhere, and expressed themselves as believing that the societies were doing a good work.

"We write at this time to ask if your society would like us to send you a speaker again this year. A number of good lecturers have promised us their services, and everything points to a splendid series of meetings in March or April.

"For the past two years our lecturers have, under the auspices of your society, visited the schools in the afternoon, and I would suggest that this feature be continued. It is not only helpful to your schools, and beneficial to your children, but at the same time it advertises the meeting of your Horticultural Society, to be held the same night.

"I am glad to say to you that the Fruit Growers at their last annual meeting at Walkerton, prepared a special programme for the delegates present who represented the Horticultural Societies. These special sessions were crowded to the doors each time, and it is the intention of the Association to hold other sessions for those interested in floriculture and home decoration at the time of the Annual Meeting in December. We hope your society will be represented at that meeting, and that your delegates may receive much inspiration at that time.

"I have just been informed by the Minister of Agriculture that the Annual Report of the Fruit Growers' Association, the Ontario Entomological Society, and the Ontario Fruit Experiment Stations, will be bound in cloth and sent to each member of the Fruit Growers' Association. As this volume will contain the report of the papers read and addresses delivered on floricultural matters at the last Annual Meeting, together with the discussions following each topic, it should be of particular interest to your members.

"I am pleased to say further that the 'Canadian Horticulturist' is steadily improving, and that we are continually receiving many kind words from our subscribers in reference to it. We ask for you continued support in the publication of this journal, and we would be glad to have any items of news from your society for publication in its pages.

"In reference to the plant distribution, I would say that some of the societies have expressed a wish to purchase plants of their own selection, and where such a desire is expressed, the Executive Committee have decided that where a plant is not selected the affiliation fee for each member shall be 75c, instead of 80c, as heretofore.

"We want to know at this time if our efforts are meeting with your personal approval. We ask this because a circular has been received from the Cobourg society, in which charges are made against our Provincial Association, which, so far as we know, are groundless. We are trying to help the Horticultural Societies in every way, but if our efforts in this direction do not meet with your approval, we should like to know in what way we can be of further service to you.

"In the circular referred to above, it is also stated that a public meeting will be held in Toronto, February 13th, to form a Civic Improvement League. If such a League be formed, it will, I presume, be in affiliation with, and under the rules and guidance of, the American League for Civic Improvement.

"I should like an expression from you at this time in reference to the work of your own Horticultural Society, which is distinctly Canadian. I enclose a separate slip, which, if it suits your views, you might sign and return to me before the 13th. This action on your part will enable us to complete statistics re the working of the Horticultural Societies in Ontario, and would also be an indication to the Ontario Department of Agriculture that the distribution of the annual grants by the Department is justifiable.

"Wishing you continued success, and hoping to hear from you in reference to the lecturer, I remain, yours truly."

The following reply was received from forty-one Societies :

"I beg leave at this time to testify to the good work being accomplished by our Horticultural Society. Under the Agricultural and Arts Act, we are permitted to assist our town members in matters of civic improvement, and our country members in the science of fruit-growing, gardening and floriculture. We believe that it is in the best interests of the entire community thus to bring the town and country people together, and anything that would tend to divorce these elements would in my mind be a step in the wrong direction. I further believe that the lecturer sent to us each year is a help to us in our work, and we trust that the practice will be continued.

"The 'Canadian Horticulturist,' while not perfect, I believe to be improving each year, and in my opinion it contains much information in each issue that should be helpful to our members.

"I feel that under our present conditions, we are doing good work in the community, and that there is nothing in 'The Act' nor in the constitution, rules or regulations to prevent us continuing the work of civic improvement or the improvement of our country homes and homesteads."

It was very gratifying to read the replies from the officers of the Horticultural Societies throughout the Province, and I trust that this Association will see fit to continue to help in the work so well carried out by these local organizations:

(g) Lecture Courses for Horticultural Societies.

Division 1. Delegate : T. H. Race, Mitchell, Ont.

Seaforth March 16	Owen Sound March 20	Hespeler March 25
Kincardine " 17	Elora " 21	Brantford " 26
Mt. Forest " 18	Elmira " 23	Paris " 27
Walkerton " 19	Waterloo " 24	Cayuga " 30

Division 2. Delegate : Wm. Hunt, O.A.C., Guelph.

Toronto Junction .. March 30	Hagersville April 3	Stratford May 1
Grimsby " 31	Tillsonburg " 6	Toronto " 5
St. Catharines .. . April 1	Simcoe " 7	Aylmer April 9
Niagara Falls " 2	Port Dover " 8	

Division 3. Delegate : T. H. Race, Mitchell.

Bowmanville March 31	Stirling April 4	Midland April 17
Millbrook April 1	Pictou " 6	Woodstock " 21
Lindsay " 2	Cardinal " 8	
Peterboro' " 3	Orillia " 16	

When arrangements were completed the following letter was sent to the Secretaries of the Societies :

Lectures Before Horticultural Societies.

"Toronto, March 4, 1903.

"Dear Sir,—Below will be found a list of the dates and places where arrangements have been made to hold meetings of the societies in your district during March and April. We have very carefully selected the speakers for these meetings, and trust that your members will not be afraid to ask questions and obtain as much information as possible from these gentlemen.

"Last year the lecturers visited the schools in the afternoon and addressed the school children upon some topic connected with horticulture. This seems to have been appreciated, for we have had many applications for similar instruction. We hope you will make arrangements, where possible, to have this feature of the work repeated, for, beside the interest the children may take in it, it will be a good advertisement for the evening meeting.

"There seems to be a revival of interest in horticultural matters generally at this time. The Ontario Fruit Growers at their last Annual Meeting arranged special sessions for floriculture and town improvement topics. These meetings were crowded at each session, and a report, in full, of the proceedings, bound in cloth, will be mailed to each of our affiliated members as soon as published.

"Trusting that you may have a successful meeting and a prosperous year's work, I remain,

As an example of the work done at the Horticultural Society meetings, I quote you here from the report of Wm. Hunt, O.A.C., Guelph :

"Meeting held at Toronto Junction March 30th. Attendance 50. Subject : Hardy Border Perennials. Audience very much interested.

Q. How often should German Iris be planted, and at what season of the year ?

A. About every third or fourth year. The Iris being early flowering, is best planted in the fall (September).

Q. What size should the clumps be ?

A. From five to ten crowns.

Q. Do you consider the double white *Lychnis* a good border plant ?

A. Yes, decidedly so. The *Lychnis Vespertina* (double white) being quite hardy and very free flowering.

Grimsby, March 31. Attendance 75. Subject : "Planning and Planting the Home Grounds" Audience large, very much interested. Apparently well pleased.

Q. My hardy roses are not doing very well, the soil is very sandy and gravelly. What do you recommend ?

A. Either take your roses up entirely and take out the sand and gravel to the depth of at least twelve inches, and fill in the bed with a compost of clay loam enriched with about one-third of well-rotted manure, then plant your rose bushes again. The

roses if taken up should be heeled in whilst the bed is being prepared. If you cannot lift the roses, take out as much of the soil around them as you can without injuring them and put the compost before mentioned in its place.

Q. What would you recommend to keep down insects on roses?

A. For the rose slug or worm, sprinkle the bushes just before the buds appear with dry hellebore early in the morning when the dew is on the foliage, or just after a shower. Repeat the operation once a week until the bushes are well in bloom. A weak solution of Paris green water, made by thoroughly dissolving about half a teaspoonful of Paris green in a small quantity of water first, then add water sufficient to make a gallon of the solution. Spray this on the bushes once or twice before the buds open. Apply this solution when the foliage is dry.

Q. Are Tigridia bulbs hardy here?

A. No. Tigridias are not considered hardy here.

Q. Do hardy roses succeed best in shady positions?

A. No. Not in the closely shaded positions, but partial shade for a few hours on hot days in the middle of the day is beneficial to the blooms, preserving them longer.

Q. Should outdoor bush roses be severely pruned?

A. Yes, the strong shoots of young or last season's wood should be cut back, leaving about four to six inches of young wood. Cut out altogether all small weak shoots.

Q. Should hardy climbing roses be severely pruned?

A. Not so severely as the bush roses. Select first of all the strong, vigorous canes you wish to leave, shorten these back to about four feet from the old wood, and trim out the very small weak wood altogether.

St. Catharines, April 1. Attendance 40. Subject: "The Propagation and Care of Window Plants." Only a fair-sized audience, very interested throughout. Invited to return at some time in near future to deliver an address on "Civic Improvement" and "How to Beautify Public and Private Grounds," the Mayor and others being very much interested in these matters.

Q. What would you do with a pot of daffodils that have flowered in the window and have died down?

A. Leave the bulbs in the pot, and put the pot in a cool place in the shed and keep them dry, when you can plant them outside in the garden in September. They are no further use for window culture.

Niagara Falls South. April 2. Addressed Public School scholars at 3 p.m. Gave particulars re culture of Asters, as the Horticultural Society is distributing 300 packets of Aster seed. Young people very enthusiastic. Meeting in evening at 8 p.m. About 50 present. Attentive audience.

Q. How shall I treat a Calla Lily when it has done flowering?

A. Give it less and less water from now until June, when you can lay the pot on its side under the shade of a tree or fence, and give it no water until the end of July, when you can bring the pot out into a partially shaded place, and start it into growth by watering it, or you can repot the tubers if they require repotting, but do not give it too large a pot, as that means a lot of leaves and no flowers.

Q. What kind of Asters are the best to grow?

A. The various types and colors of the Victoria Aster are considered the best. The Semple's branching Aster is the strongest growing and blooms very freely, but the blossoms are not as nice, either in shape or color, as the Victoria Aster. I consider the latter the best type of Aster.

Q. What do you do to increase the size of Aster blooms?

A. By pinching off the small lateral flowers on the sides of the stem you will increase the size of the terminal blossoms.

Hagersville, April 3rd. Addressed pupils of Public Schools at 3 p.m., and gave address on "Culture of Asters," as the Horticultural Society is distributing Aster seeds to scholars for an exhibit in fall, at my request. Meeting of Horticultural Society in

evening. About 40 present. All very much interested. Gave composite lecture on "Window Plants," "Civic Improvement," and "Planning and Planting the Home Grounds."

Q. Which variety of Begonia do you consider best for window culture?

A. The spotted leaf variety, Begonia Manicata Aurea, is the most enduring variety, and its foliage looks bright and pretty at all times.

Q. What strawberry do you consider to be the best variety for home use?

A. The Clyde.

Q. What is the best time and method of pruning flowering shrubs?

A. By starting when the shrubs are young. Almost all of the flowering shrubs can be pruned when in flower by thinning out the most prominent shoots. The trimmings can be used for indoor decorative purposes if cut when in flower. If shrubs are large and have been neglected prune in autumn or early spring. Never clip flowering shrubs with the shears. Lawn Hydrangeas require pruning back severely in fall or early spring, leaving as a rule only four or five inches of the young growth.

Tillsonburg. April 6. Addressed Public School scholars, 200. High School 75. Induced Horticultural Society to distribute Aster seeds. Gave talk on "Aster Culture." Children very much interested. Good meeting in evening in Town Hall. 75 present. Subject: "Window Plants, Civic Improvement, and Planning and Planting the Home Grounds."

Q. When is the best time to prune Maple trees?

A. Hard or sugar maples are best pruned sometime during July and August. The soft maples and sycamores are better pruned later on in the fall or very early in the spring.

Q. Can tuberous-rooted Begonias be grown in the window during the summer?

A. Yes, by securing some tubers about this time and starting them in sandy soil in small, well-drained pots, and repotting them into larger pots when the growth is three or four inches in length. Good, rich, loamy soil should be given them when potted the second time. Do not give them too much water until the tubers have started well into growth. A too sunny position in the window is not advisable for tuberous Begonias.

Simcoe. April 7th. Addressed Public and High School scholars, about 300, and inspected new park. Horticultural Society here will distribute Aster seeds or plants next year, perhaps this year. Meeting in Town Hall in evening. Good attendance. Composite lecture same as at Tillsonburg. Great interest shown on remarks re "Civic Improvement."

Q. Why is it that so many coarse kinds of grasses are often seen on lawns, and finally kill out all the finer grasses?

A. Imperfect drainage, both of the surface and sub-soil of the lawn, is oftentimes responsible for the appearance of coarse weeds and grass and other noxious weeds on a lawn. An exhausted soil is often the cause of the finer grasses dying out. Drought in summer also allows the strong coarse weeds to overpower and kill out the finer lawn grass.

Q. What are the best grasses to use for seeding a lawn?

A. A mixture composed of a pound each of the following varieties of grasses and clover makes a good lawn mixture, viz., *Agrostis Vulgaris*, *Agrostis Alba*, *Agrostis stolonifera*, *Poa pratensis* or Kentucky Blue-grass, one-half pound Dutch Clover.

Port Dover. April 8. Addressed Public and High School scholars 3 p.m. Horticultural Society will probably make a distribution of Aster seeds to scholars. Meeting in Town Hall, 8 p.m., about 75 present. Mixed subject for lecture same as Simcoe. Audience interested and pleased.

Aylmer. April 9. Had splendid reception here. Was conducted by Mr. D. H. Price. Sec.-Treas. County Fair, Reeve and others to the Public and High Schools. Addressed scholars on Floriculture, particularly Asters, as Horticultural Society is distributing seed to scholars. flowers to be exhibited at County Fair in September. Good meeting. 75 in

evening. Composite lectures as before. Have since sent Mr. Price particulars to govern Aster exhibit.

Q. When do you consider the best time to prune the hard maple?

A. From July to October.

Q. Do you consider the Norway Spruce a good lawn tree?

A. No, not for small lawns. The Norway Spruce requires a great deal of space (25 to 30 feet) to develop their full beauty. They are then really beautiful trees. The miserable-looking clipped specimens we usually see on small lawns do this noble tree scant justice. As wind-breaks these spruce are useful, or they will make noble, graceful specimens where they have plenty of room to grow and develop themselves.

(10) Toronto Industrial Exhibition.

As one of the representatives of this Association on the Fair Board of the Industrial Exhibition, I beg leave to make the following brief report: As in former years, the building was found to be unfitted for the needs of the fruit business, in fact, the entire building devoted to fruit and flowers would not be too large for either display by itself. As a result of the cramped space and the poor facilities for showing, a large number of the fruit men met in the Farmers' Institute tent, during the time of the Exhibition, and appointed a committee to confer with the Industrial Board, with a view to improving the conditions at the fruit building. At the Directors' luncheon, also, the same day, Dr. Mills, of the Agricultural College, and Mr. T. H. Race, of Mitchell, made emphatic speeches showing the absolute necessity for the Fair Board taking some action in the very near future. As a result of all these objections, the Exhibition Board are at this time preparing a by-law to submit to the ratepayers of the City of Toronto, asking \$25,000 to be voted for the purpose of erecting a new building for fruit on the exhibition grounds.

In a conference with the Secretary of Toronto Exhibition a few days ago he informed me that extensive improvements were contemplated on the fair grounds during the coming season, and that the very first move would be in the direction of a new building for the exhibition of fruit. The Secretary also required me to bring the matter before this Association and asked that a committee be appointed, or the Executive instructed to consult with the Toronto Fair Board in reference to plans for the new building.

The Fruit Exhibit of 1903.

On the whole, I think the fruit exhibit was fully up to that of other years in quantity and in many cases better in quality. In many classes the competition was quite keen. In the large collection of apples the first prize was taken by our director from the Quinte district, Mr. W. H. Dempsey. His exhibit was admired by everyone entering the building. The second prize was also won by a Bay of Quinte man, and the third went to Hamilton. In all sections in the apple classes the competition was close, and an exhibit to take first prize had to be of the very highest quality.

In apples and pears the bulk of the prizes went to the Niagara district, while in peaches and plums the same district was also successful, although the exhibit by Mr. W. W. Hilborn, of Leamington, showed plainly that had he been a competitor the Niagara people would not have won so easily.

In grapes there was a grand exhibit, and it took the judges nearly the entire day to get through their work. Most of the prizes went to the Niagara district, Mr. W. J. Stewart, of Homer, winning the silver medal for largest collection. St. Catharines was second and third, while the other prizes were distributed throughout the peninsula and Burlington district.

In the district competition the Township of Niagara and the St. Catharines Horticultural Association were the competitors, the latter was awarded the prizes, not because of the superiority of its exhibits, but for the reason that the Niagara people

had not complied with the rules in reference to labelling their exhibits. This has caused a good deal of hard feeling, and I have been asked, as representative of this Association, on the Toronto Fair Board, to take the matter up and help sustain the protest made at the time by the Niagara people.

I think the time has come when we should encourage the exhibit from districts. In this way the large number of visitors, who attend the exhibition every year, will become impressed with the suitability of districts for certain kinds of fruit growing, and those districts will soon become noted for the kind of fruit best suited to their soil and conditions. English live stock men have for years pursued this policy; one county is noted for a certain kind of sheep, another county for breed of cattle, another district for heavy horses. etc., and people going in to buy stock in England move directly to one point and complete their business. If this could be done in Ontario with our fruit business it would cut out the necessity for so many middle men, and large buyers could be directed to one point and there secure car loads, and if necessary ship loads of a single variety.

Fruit Stations.

It would be like reading a catalogue to discuss the exhibits of our fruit stations. They were admired by everybody, and I would suggest that hereafter whoever may be employed as Superintendent of these exhibits be requested to prepare an accurate report of this part of the exhibition, that it may be published in the Report of the proceedings of our annual meeting.

Practical Demonstrations.

Mr. A. McNeill of the Dominion Fruit Department, and his associates were located in the Implement building, and disseminated an enormous amount of information in reference to the handling of fruit. Young ladies were constantly engaged in packing and unpacking boxes, answering questions, and giving information in reference to the grading and packing of fruit. All who saw this work commended it highly, but unfortunately there was not room in the fruit building, and only those interested in farm machinery came in contact with Mr. McNeill and his assistants. In the new building this Board should recommend that provision be made for practical demonstrations on all important matters pertaining to fruit growing, and a large auditorium should be provided for lecturing and demonstration work along fruit lines during the progress of the fair.

(II) Canadian Horticulturist.

On the subject of this publication, your Executive Committee have given a great deal of thought, and we think the time has arrived when something definite must be done to change the general style, appearance, and subject matter of this important magazine. Probably during the last twenty-six years, no one factor has done as much for improvement of fruit and flowers in Canada as the "Canadian Horticulturist." Further than this, there is no doubt that it is still an important factor in certain directions; but at the same time, we find it almost impossible to get paying advertisements for the "Canadian Horticulturist" in its present form. I think there is room for an up-to-date horticultural journal containing many times the amount of reading matter which we publish. It should contain market reports; the work of our Experiment Stations; methods of co-operative buying, selling, and shipping; prices of materials; interviews with nurserymen, fruit growers, commission men, and transportation companies; it should also have a strong department on the subject of "Fruit as Food," including cold storage, preserving, pickling, etc. Further, there should be a strong department devoted to Horticultural Societies. This is now being done to some extent under the term of "Civic Improvement," but nothing definite is being published from month to month as a guide to Societies in their work. It has also been suggested that the Dominion and Ontario Departments of Forestry be asked to co-operate with us with a view to establishing a department in the journal on this subject. These are matters for your consideration, and I hope they will be thoroughly discussed at this time.

Wm. Rickard, M.P.P.: I have listened with a great deal of interest to this very important report. In reference to the action taken in connection with the exhibition in Toronto, that was a splendid idea, and the way the Secretary brought it before the exhibition authorities, and obtained the promise that there should be a certain amount of money expended and provision made for the proper display of fruit, is very commendable.

A. McNeill: The Secretary has shown by his report that he has been at work in connection with the Executive during the year, and I think the meeting should either commend or criticize the work done. For my own part, I have worked in hearty accord with Mr. Creelman on the Executive this year, and can specially commend his spirit and aims and the whole-hearted way in which he takes hold of things and carries them out.

The report is so large that I can only select one or two of the vast number of subjects dealt with during the year. First, in the matter of local organization; I feel that this is a most important work. If he had done nothing else than take up this work he would have earned laurels for it alone; it lies at the base of successful fruit growing. It is the market end of the business in which we must now interest ourselves. I think we should do less educational work at these conventions; the day has passed for that here. I would continue that work with all the vigor we can put into it through the local Associations, while for the next few years we devote our attention to the market end of the business. I most heartily support him in his desire to make this Association commercial. I use the term advisedly—commercial in its aims. This matter of buying, selling and securing markets and buying materials co-operatively is quite within the scope of the organization. I think we might even enlarge our scope and appoint an organizer to look after commercial matters, who would be a specialist; an officer who would keep in close touch with the Secretary and Executive. It may be that the Secretary could do this work; but there is need of an officer who, having surveyed the whole field, could be called upon to go and organize any particular section for a specific purpose. Suppose in some apple-growing sections the prices obtained by the growers have not been what they should be. In some districts, for example, this year the farmers received only 75 cents for good winter apples. In such instances it would be in the interest of the fruit-growing industry to get right into such districts and organize them. We have come to the point when we must regard the selling of our neighbors' fruit as of just as much importance as the selling of our own, and until we recognize that thoroughly we shall never have this thing on a real commercial basis. In districts where, say, twenty canning factories consolidate into one, what chance has the unorganized fruit grower?

Regarding fall fairs, there are enormous opportunities for education at these fairs; but we have got to systematize these things. We have had very good judges at these fairs, but there is need of a little education even among expert judges of fruit. The stock men have come to the conclusion that even the best of them do not know it all, and that it is necessary to have schools in judging; but we fruit growers do not seem as ready to adopt this idea. Expert judges should be instructed, if for no other reason than that there may be uniformity in their decisions. I have observed the greatest diversity in this connection, which is simply the result of want of organization and lack of uniform standards. The report is, I consider, a most valuable one, and the only thing that will spoil it is to pass it over and say nothing at all about it.

The President: There are a large number of important matters in connection with it which ought to have fuller consideration before it is finally closed, but on account of the fact that a number of subjects touched upon in the report will be taken up more fully in connection with our general program, it is probably well to leave the matter in your minds for the present for consideration, and when those particular subjects come up, what you have heard in the report will probably throw more light upon them.

Thos. Beall: Referring to the exhibit of fruit at the Toronto Industrial, I should like to ask whether it is wise to exhibit at that exhibition, which is held in August and September, our best winter apples, as they are not mature at that time.

G. C. Caston: With regard to the Fruit Experiment Stations' exhibits, I have maintained for some years that it is not the proper place for the Stations to exhibit at all. The local district shows, which are usually held late in October, would be the place for them to exhibit. They would then come into contact with the people for whom the stations are working. In the Northern part of Ontario the Northern Spy, for instance, does not develop and color till the end of October. If you show it at Toronto in September, the people do not know what variety it is. There is nearly three weeks' difference between southern Ontario and North Simcoe, where I live, in this respect, so that when we come to exhibit these varieties side by side with specimens grown in the south, it is not a fair comparison, and does not do our apples justice. I think, therefore, that Toronto is the wrong place at which to make an exhibit from the stations.

Q.: Why not exhibit at both?

G. C. Caston: If we are to exhibit at both, all right.

J. L. Hilborn: I am entirely in sympathy with this view, and think there should be an exhibit in the county where the station is located so that it may be an education for the men in that locality.

R. B. Whyte: Fruit should never be exhibited till it is mature; it does nothing but harm otherwise.

The President: I think there might be a revision of the prize list to cover that matter. So far as the Experiment Stations' exhibit is concerned, immature varieties might be left out till the local fairs meet.

G. C. Caston: Even our fall apples are not mature until the first week in September, except, perhaps, Duchess and Astrachan.

A. D. Harkness: It is the first of October with us before the Fameuse varieties mature and have their color developed. You will all bear me out in saying that apples grow more in proportion in the last two weeks before ripening than all the rest of the season put together.

G. C. Creelman, Secretary: I think that the meeting ought to take some action in reference to the prize list at the Toronto Fair. When I was talking with the Secretary lately, I asked him what about the prize list. He said that this Association had never taken much interest in the prize list. I asked him if he wanted us to, and he replied that if we would have a committee appointed at our meeting to go over the prize list and say what we should like, they would endeavor to meet our views as far as possible.

In reference to exhibiting winter apples, while they may not be mature, we must not overlook the fact that we have at Toronto an opportunity of exhibiting our fruit to many thousands of people, thus advertising the varieties of fruit grown in Ontario. As the present Fair Board is going to prepare the prize list for next year, before Christmas if possible, it would be well for our committee to take the matter up with them at once.

Murray Pettit: Is it not better to exhibit these later varieties even if not fully developed rather than not exhibit them at all?

G. C. Creelman: It might look as though we did not have these late varieties in Canada if we did not exhibit them. It might be stated on the exhibit that the specimens were not mature.

Alex. McNeill: There is no reason why we should not secure our fruit a year ahead for advertising and exhibition purposes, placing it in cold storage in the meantime.

Wm. Rickard, M.P.P.: We have lots of fruit ready for exhibition at the time of the Toronto Fair, and I think it is a case where we should do the best we can with the fruit we have at our command at the time.

Harold Jones: As I understand it, the object of the exhibit is simply to demonstrate the capabilities of the various sections of the country, and it is not competitive. The prize list of the Toronto Fair is competitive, and at the date their fair is held we cannot compete with the southern growers. I do not think it is wise to try to bring harmony between the two because the exhibits are made with a different object in view. I think we should exhibit immature varieties, stating on the label that they will not reach maturity until such and such a date. This would give buyers a knowledge of where such varieties could be obtained at a given date.

On the motion of J. S. Scarff, seconded by R. B. Whyte, the report of the Executive was then adopted.

TREASURER'S REPORT, 1902-3.

RECEIPTS.

Balance on hand Dec. 1, 1902.	\$ 241.56
Members' fees	3,617.59
Government Grant	1,800.00
Advertisements	535.71
Binding	7.45
Books	43.99
Miscellaneous	11.10

\$6,257.40

EXPENDITURE.

Canadian Horticulturist.....	\$2,767.80
Salaries	1,200.00
Annual Meeting	297.10
Commission	289.05
Reporting	50.00
Auditing	23.55
Illustrations	292.74
Affiliated Societies	14.60
Express and Freight	7.09
Postage and Telegrams	177.96
Collections	7.70
Committees	160.25
Binding	6.05
Printing and Stationery	33.45
Books	37.29
Premiums	237.31
Miscellaneous	13.10
Balance on hand	642.36

\$6,257.40

Details of Expenditure.

Canadian Horticulturist: A. A. Plain (copying proof for editor), \$5.40; Independent (stationery for editor), \$5.00; Buntin, Gillies & Co. (wrappers), \$3.68; W. L. Woolverton (mailing), \$8.58; Wm. Forbes (postage on "Horticulturist"), \$10.56; Canadian Express Co., \$3.58; Spectator Co., \$2,713.85; L. Woolverton, \$8.25; A. Torrey (stationery), \$2.00; P. W. Hodgetts (expenses to Hamilton), \$3.05; W. Mitchell (express on cuts), \$3.58	\$2,767.80
Salaries: L. Woolverton, \$1,000.00; G. C. Creelman, \$200.00	1,200.00
Annual Meeting: Walkerton Orchestra, \$20.00; A. E. Sherrington, \$8.55; John Craig, \$44.35; C. Gripton (stamp), \$1.25; H. Snelgrove, \$17.80; Wm. Hunt, \$4.95; R. B. Whyte, \$26.95; A. M. Smith, \$11.85; T. H. Race, \$10.25; J. Tweedle, \$8.55; W. Lochhead, \$4.55; J. B. Reynolds, \$5.10; C. L. Stephens, \$16.55; W. W. Cox, \$11.40; J. S. Scarff, \$9.55; W. H. Bunting, \$11.95; Bryant Press, \$33.50; Walkerton Herald, \$5.00; Walkerton Glocke, \$17.45; Walkerton Telescope, \$17.40; express on fruit, \$9.70; telegrams, .45	297.10
Commissions: December, \$24.80; January, \$44.40; February, \$72.85; March, \$66.55; April, \$40.40; May, \$28.20; August, \$10.00; September, \$1.85	289.05
Reporting Annual Meeting: W. B. Varley	50.00
Auditing: A. H. Pettit, \$13.55; W. M. Orr, \$10.00	23.55
Illustrations: Grip, \$283.94; Globe, \$1.80; P. W. Hodgetts, \$2.00; J. Buchanan, \$3.00; F. Shutt, \$2.00	292.74
Affiliated Societies: A. McNeill, \$5.00; R. B. Whyte, \$3.60; Walkerton Telescope, \$8.00	14.60
Express and Freight: Can. Exp. Co., \$3.00; H. G. & B., \$3.05; G.T.R., \$1.04 ..	7.09
Postage: Stamps for office, \$150.00; stamps for editor, \$15.15; cash, \$12.81 ..	177.96
Collection: Bank of Commerce, \$7.55; Wm. Forbes, Grimsby, .15	7.70
Committees: T. H. Race, \$52.75; L. Woolverton, \$54.15; W. H. Bunting, \$29.60; J. S. Scarff, \$7.85; H. Jones, \$15.90	160.25

Binding : Brown Bros.	\$6.05
Printing and Stationery : A. Torrey, \$1.95; Bryant Press, \$31.50	33.45
Books :	37.29
Premiums : Evans Seed Co., \$72.10; Morris, Stone & Wellington, \$58.60; Webster Bros., \$106.61	237.31
Miscellaneous : P. S. Mills, \$3.00 ; P. W. Hodgetts, \$8.60 ; G. C. Creelman, \$1.50	13.10

Examined and found correct this 20th day of November, 1903.

(Signed) J. M. DUFF, Auditor.

Mr. Race called attention to the greater cost of the Horticulturist this year as compared with last, and it was pointed out that the present year included thirteen months.

The President : It must be a source of satisfaction to the Board that, notwithstanding the large amount of work done during the year as outlined in the report of the Executive, our finances are in such satisfactory shape at the present time, there being a balance of some six hundred dollars on hand, which is a considerable increase from last year.

On motion of G. C. Caston, seconded by A. M. Smith, the report was adopted.

The question of the salary of the Secretary-Treasurer then came up, and was fully discussed. In view of the work being done and the desire of the Board to retain the services of the Secretary, in view of inducements held out to go elsewhere, it was moved by T. H. Race, seconded by G. C. Caston, that the matter be referred to the Board of 1904, with a recommendation that the salary of the Secretary be increased. (Carried.)

R. B. Whyte asked why it was that no representative from this society was appointed to attend the meeting of the American Pomological Society in Boston this year. This is the most important meeting of fruit growers in the world, and we had no exhibit there and no representation. There were large exhibits from different States, and the exhibition was visited by thousands of people.

Th President : I think it was an oversight at the last meeting, which was somewhat hurried. It was my intention to attend that meeting, but I was so busy that I could not do so. The point is well taken that we should be represented at this important convention.

DIRECTORS' REPORTS.

It was moved by Mr. M. Pettit, seconded by Mr. Morris, that the Directors' Reports should be taken as read, and submitted to a committee before printing.

Mr. Woolverton and some others thought they should be read and discussed by the meeting, as matters of importance might arise out of them. This view was taken by the meeting, which declared in favor of the reports being read.

Division No. 1.—A. D. Harkness, Iroquois.

With Mr. Lick, I attended a meeting at Iroquois on April 7th, Morrisburg, April 23rd, and at Lancaster on April 24th. At these meetings the process of making the Bordeaux mixture was explained and demonstrated, as well as a practical demonstration on pruning the orchards.

In this district there are so few engaged in fruit growing from a commercial standpoint that it is a difficult matter to organize our Association, and then it is more difficult to make a success of it after it is organized. If, in a district like this where there is not very much fruit grown, some arrangement could be made to have meetings, under the auspices of the Farmers' Institutes, for addresses and discussions on fruit growing, and demonstrations on pruning and spraying by persons who are acquainted with the

local conditions, I think much benefit might be derived from it and the Farmers' Institute would be benefited as well.

In this district, I think, there are only three townships in which fruit is grown in any quantity at all, and these border on the St. Lawrence River. In Glengarry there is scarcely any grown, even for local use. Prescott I do not know anything about as yet. In the Township of Osnabruck, in Stormont, there is considerable, but scarcely any in the rest of the county. In Williamsburg and Matilda, in Dundas, there is considerable, but not much in the other townships. The apples that do best with us are of the Fameuse class, and can be and are successfully grown for commercial purposes, but from my observations I do not think it will pay us to grow the later winter sorts, except for local use—that is, for the farmer to grow them for his own use.

Plums. We cannot expect to grow the domestic plums successfully, as about four years in five the fruit buds will be destroyed. I am trying the American class of plums. Last spring I planted eight Stoddard, eight Hawkeye, and eight Wolf. I got from Danlop, of Outremont, four Raynes, two Mountain, and two Mount Royal to test them in our district. Small fruits, such as strawberries, currants, gooseberries, and raspberries can be grown successfully.

Division No. 2.—R. B. Whyte, Ottawa.

The principal item of Horticultural interest in district No. 2 during the past year was the unprecedented drought that afflicted Eastern Ontario in the early part of the season. No rail fell from the middle of April till well into June; this, with late spring frosts, utterly ruined the strawberry crop, few growers having enough to be worth picking. The prospect for the coming season is far from good, as practically all the plants put out last spring died before the rain came in June. The later small fruits were not so badly injured. Raspberries were a good deal under the average. Currants and gooseberries were a fair crop, but undersized. The shortage in small fruits was more than made up for by the immense crop of apples, the largest on record in this district. The dry spring was evidently unfavorable to the spread of scab, codling moth, etc., as these enemies of the apples, usually so injurious, were almost unknown.

The splendid specimens of Wealthy, Fameuse, and McIntosh exhibited at this meeting are evidence of the capabilities of this eastern section for growing this class of apples. This year for the first time the local grown fruit was an important factor in the Ottawa market. And it will not be long before our own growers will be able not only to supply the local market, but will have a surplus for export. There have been many thousands of trees planted in the last few years, which are now coming into bearing. We hope that some of the large collection of winter apples exhibited at the Central Experimental Farm at this meeting will turn out to be commercially profitable and prove as well adapted to this district for late winter fruit as those above mentioned are for the early winter months. Again, our Horticultural Society has to report the most successful year in its history. An increase in membership of 38, in the attendance of 137, and in the entries at the different shows of several hundreds, which now average over two hundred per month, all show a very satisfactory growth in the influence of the Society.

A new departure was made this year with the idea of interesting the children of the public schools in horticultural work, three packages of Aster seed each being given to one hundred and forty children, with simple instruction how to plant and care for them. Prizes in cash and Gladiolus bulbs were offered at the September show for the best flowers grown from this seed. The exhibit made by the children, not only in quantity, but in quality was very gratifying to the Society, and the experiment will be continued on a larger scale during the coming season. We also published our first bulletin this year, an eight-page pamphlet, giving lists of the best annuals, perennials and vegetables for the Ottawa district, with notes on their habit of growth and cultivation. It was so well received by our members that we hope to issue similar bulletins from time to time as required.

Division No. 3.—Harold Jones, Maitland.

Since making my last report to this Association I have done some little work in the interest of the Society, and, I hope, of benefit to the fruit growers of my division.

In December last I attended the annual meeting of the Quebec Pomological and Fruit Growers' Association, held at Waterloo, as delegate from this Society. I find that there is more interest being taken in fruit topics from year to year. The attendance was very fair at all the sessions, and the subjects were well discussed by the public, and the fruit display would have been a credit to many of our fruit-growing centres in Ontario.

In January I attended twelve meetings of the Farmers' Institute in my division, and gave practical talks on fruit growing, taking up the question of varieties, and giving illustrations in budding, grafting, pruning, etc., and in preparing mixtures for spraying, which created much interest, and led to animated discussions at most places.

These talks eventually led to quite a large correspondence with parties asking for hints and advice on location of orchards, drainage, varieties, etc., as well as many samples of fruit by mail for identification.

I replied to all questions when possible in as plain a manner as I could, and I hope it has started many in the right direction.

The experimental fruit plot on my own farm affords an ocular demonstration of the success or failure of many varieties of fruit to many visitors during the summer.

The unusually dry weather that prevailed during part of April, May and first half of June passed the fruit (apples) over the critical part of the season when the most damage is caused by spot; and, although we had almost continuous rain since June 16th, the fruit is absolutely clean, even on orchards that were not sprayed at all. This fact gave me an opportunity of pointing out to many the vital importance of spraying early and often in seasons of normal rainfall in the spring months, for the season has shown us that if the spot can be kept absolutely in check until the middle of June our crop is practically safe. In past seasons I have found that trees that I have sprayed every week from the bursting of the bud to the first of June, and then stopped, were freer from spot than those not sprayed so frequently and continued to the first of August. This point needs further careful study, for we must admit that we do not know all about spraying yet.

Fameuse, McIntosh and varieties of that group of family are standards for my division, and are the most profitable to grow from a commercial standpoint. For a later keeper we have nothing yet more profitable than Scott's Winter, Golden Russet, and possibly Canada Red, but Milwaukee gives promise of being profitable; though being of large size, it has a tendency to drop during September gales, though not nearly so badly as Pewaukee, which makes that otherwise profitable apple very unsatisfactory to grow. We can grow Spys and Baldwins top grafted, also Kings; but why not leave these varieties to the lake counties where they excel us every time, and make more and more of a specialty of the Fameuse group, for we are in the great Snow-apple belt of the St. Lawrence valley, where the fruit grows to perfection, and will keep in ordinary cellars until February?

Among the Pears we have Clapp's Favorite, Flemish Beauty and Ritson, three pears that do well in this division, and are of good quality. Intending planters would do well to stick to these varieties until other pears of good quality are found by the stations to grow successfully, for so many of the so-called ironclads are so poor in quality that there is very little use in planting either for home use or market.

Plums of the domestic class are of very little value in this division. The most successful or promising are Lombard, Gueil, Yellow Egg, and Glass Seedling, but even these will only come through the winter without injury to the fruit buds about two years out of five. Japans are also proving unsatisfactory, being tender in fruit bud. Red June Burbank, Ogon, and Abundance will bear on seasons that are favorable for Lombard. The most satisfactory plums are those of the American type, Wild Goose, Whitaker, Milton, Hammer, Forest Rose, Col. Wilder, Hawkeye, Cherry, Stoddard being the most satisfactory of this class. These plums are fair for cooking, but are of very little

value where European plums can be grown. However, they will be a boon to those in the Eastern counties when grown in gardens for family use.

Among the cherries, Ovel and Oshtheim give splendid results, bearing good crops of fair-sized cherries. Montmorency is partially tender in bud, only bearing a scattered crop. May Duke is tender in bud, also Reine Hortense. E. Morello is hardy and bears well.

Division No. 4.—W. H. Dempsey, Trenton.

The heavy frost of last December did considerable injury to the buds of the more tender varieties of fruit. Hence the crop of the more choice varieties of plums and cherries was very light; also some of the apples were injured. The early spring being cool and wet, no caterpillars showing, and seeding time being at hand, the farmers took it as an excuse not to spray as usual. If the season had not been unfavorable for the development of fungous diseases, the growers would have suffered a great loss. As it was, the fruit was almost quite free from fungus and insects, although in some sections a few pear trees suffered with blight. The pear-tree *Psylla* also made its appearance to quite an extent; in a few orchards the trees were so badly infested that they were noticeable for some distance.

The year has been a favorable one for all engaged in the fruit business in this district; fair crops of clean, well-colored, good-sized apples brought fairly good prices in the orchard. Pickers, packers and coopers received high wages for their services, the only drawback in this business was the scarcity of help and barrels.

The County of Prince Edward has again proved itself as being one of the best apple-producing counties in the Dominion, producing between 200,000 and 300,000 barrels of export apples this season, as well as a large quantity of Damson plums. Some of the growers had from 100 to 400 bushels of plums growing, you might say, wild, in fence corners, and sold from 75 cents to \$1 per bushel to the buyers.

There are not many pears growing in the county, but what trees existed were heavily loaded, especially Flemish Beauty, which were particularly fine, and sold for good prices. There are also large quantities of small fruits grown, most of which are sold to canning factories and local markets at fair prices.

In the Counties of Hastings, Lennox and Addington, apples have not been grown to any great extent till within the last ten or fifteen years, when large orchards have been planted, principally in the townships lying along the water fronts. Many have fruited well this year.

The apple growers in this district find the fruit houses a decided advantage to them for storing their fruit, particularly the cold storage in Trenton, where the fruit is cooled down and held at a low temperature for but a trifle more cost than ordinary storage.

Several orchard meetings were held in the early part of the season, and were fairly well attended by growers eager for information on fruit growing.

Elmer Lick gave a practical talk on spraying and pruning, which was very much appreciated, also F. J. Barber, on the advantage of thinning fruit.

Division No. 5.—Wm. Rickard, Newcastle.

As Director for Division No. 5, I beg to report that the local Fruit Growers' Associations formerly organized at Bowmanville, Newcastle and Orono, in Durham County, have not been active or in good working order during the past year. For a time there was considerable interest taken, especially by the membership in Bowmanville, where a number of interesting and profitable meetings were held. Among other things that received prominence was that of building a cold storage fruit house, but up to the present no definite action has been taken along this line.

In speaking of fruit culture in Northumberland and Durham, I might properly confine myself mainly to apples. There are a few who have to a limited extent gone into growing pears and plums and small fruits, with some measure of success, but the

king of all fruits, the apple, has been and is now receiving by far the greater part of the attention and work of the fruit growers of those united counties, and in my opinion very properly so; for when we consider that the townships bordering on the north shore of Lake Ontario possess the natural conditions of soil and climate for the growing of apples, that cannot be surpassed on the North American Continent, and when we further consider the almost unlimited prospective markets for this inestimable health-giving fruit, both in the east across the great Atlantic to the teeming millions of Europe, and also in our great and glorious West (I say our glorious West, for it is ours, the heritage of our forefathers), in the near future destined to be the home of many millions of well-to-do people, surprising the world in the production of the greatest of cereals—wheat—making them prosperous to such a degree, that, while generally speaking they will not be able to grow fruit, they will have the purchasing power to buy—we say that as near as we are able to look into the future the prospects for growing apples in this favored district along the north shore of Lake Ontario are, to say the least, fairly good, and a considerable number of our most intelligent and progressive landowners are acting on this outlook and planting quite largely young orchards of apple trees of very considerable extent. As an illustration, I may say we find in the second concession of the Township of Clarke, in less than one and a half miles square, some two hundred acres in apple orchards, three-fourths of which may be said to be young orchards, some of them just coming into bearing. As an example of the success that can be made in apple growing here by giving it careful, intelligent management, let me say that I picked and packed this season from thirty-five Ben Davis trees just ten years planted one hundred barrels of apples.

Notwithstanding the above facts, there is, I am somewhat sorry to say, another side to the question of apple growing in this district. Some of our farmers having orchards are disposed to neglect them, allowing the trees to take their chances. If the orchard receives any attention at all it is after everything else is done. The inevitable result is that we have too much poor fruit, and not enough of real good fruit, and herein lies the success or failure in the growing and marketing of apples. No better work can be done than to educate every man having an orchard up to a careful, intelligent management of the same. This will result in success, while neglect and inattention will result in failure; and this will apply not only to the individual, but to a certain extent to the great and important apple business of this country.

The apple crop in this section for the present year has been very abundant and of excellent quality. As near as I am able to ascertain the shipments at the various railway stations up to the present time considerably exceed anything heretofore, except, possibly, in 1896, the year with a bumper crop. Summing up the shipments this season, together with what is in store, I believe I am safe in saying that Northumberland and Durham have produced 300,000 barrels. But this great and important industry in this county is only in its infancy; in a few years from now it bids fair to double and treble in this favored locality, the fruit Townships of Northumberland and Durham.

I would suggest that in another year at our Farmers' Institute meetings the culture of fruit be thoroughly dealt with, in giving the fullest instructions in regard to handling fruit, more especially the apple.

Division No. 6.—Elmer Lick, Oshawa.

In making this report, I think that the most important statement that can be made is that Division No. 6 has never produced as much fruit of as great value in any previous year. The apple crop, the greatest staple fruit in most of this division, was large, and exceedingly fine in quality. The abundant rainfall of the past three years gave the trees vigor, the favorable weather during blossoming favored fertilization, the conditions favorable to the development of scab did not exist to any great extent. The insect pests were not serious, and to finish up with the weather during the picking and packing season was the best since 1892.

Even with all these favorable conditions, and none of them could be better, thousands of barrels of the finest apples have been wasted. Several reasons have led to this: first, the scarcity of labor and its high price; second, the greatest difficulty on record in securing barrels. The apple packers, in order to secure help, have had to pay up to 20 cents per hour for picking and packing, and in order to secure barrels have paid up to 75 cents.

The cost of picking, packing and barreling has been exceptionally high, averaging somewhere about \$1 per barrel, in many cases even more. Under the usual conditions of heavy shipments week by week, the price in the English market would have fallen to such an extent that the apples would have scarcely paid for picking. If the English fruit crop had been heavy, the larger portion of the apples in our section might have better stayed on the trees. Nevertheless, the fact remains that apples of standard varieties, picked, packed and shipped in most careful and economical way, have netted from \$1.25 to \$1.50 per barrel for the apples on the tree. This, of course, is only where barrels were stored at 35 cents, and where picking and packing went on at the same time.

Many sections sent complaints that there was no dealer buying there. Careful enquiry has shown that in such cases orchards were small, varieties numerous, consequently cost of packing high, and very great difficulty in securing cars of two or three varieties at one time. If the small orchardist is to get highest price for his apples, there must be more co-operation, either between the producers or between the producer and dealer. Barrels must be stored early and in a clean place; producers must take more responsibility in regard to picking, packing and drawing to market.

In some parts of the district plums were scarcely worth packing. In common with other sections, large quantities of plums were allowed to rot for want of a market. Yet we believe that if the producer could have known where to send them that fair prices could have been obtained. The distribution of our fruit crop is of vital importance.

Division No. 7.—M. Pettit, Winona.

There has never been in Division No. 7 such an immense crop of fruit. Small fruits were good. Peaches a heavy crop, but not enough thinning done and too many small peaches grow.

Fully one-half of the plum crop was not marketed on account of the low price and the rot. During showery weather it is impossible to control the rot by spraying with Bordeaux Mixture. Growers begin to realize that too many plum orchards have been planted.

Grapes were a lighter crop than usual, but the quality was good and prices were very satisfactory.

Pears were exceptionally fine and free from fungus. Blight has been very destructive, and many trees have been entirely destroyed. Close cutting out as fast as it appeared did not prevent it from spreading. Clapp's Favorite and Bartlett suffered the most. Keiffer, which could be most easily spared, suffered the least. This season convinces us that too many Keiffer orchards have been planted. Shipments to Great Britain have not sold nearly as well as previous years, and canning factories here have not have been able to handle this season's crop with not one-fourth of the trees planted in full bearing. Many of them will be grafted with better kinds.

Apples have been a full crop, and sprayed orchards have been far the most profitable.

Taking the season as a whole, fruit growers have had a profitable year.

Division No. 8.—E. Morris, Fonthill.

I have to report that the fruit crop of this season has been the most abundant of any year in the history of the Niagara District. Following a large crop the past year,

under ordinary conditions we should have expected only a moderate yield of the large fruits, but owing to freedom from storms during May all blossoms developed fruit, particularly plums, peaches and cherries, the former being more than the market could take, and in view of another such glut I would like to draw the attention of the Society to the fact that there are thousands of tons of plums being shipped annually from Germany and other European countries to England in the form of pulp to be manufactured into jam. I would suggest that steps be taken to ask for a grant from the Government to experiment on this line.

Peaches sold at a very low price, but being such a large crop proved fairly remunerative to the grower.

Cherries were also a large crop, and sold proportionately higher in the market than any other fruit.

Pears were a medium crop and prices fair.

Apples were above the average crop, and usually free from scab and other fungous diseases. They proved a very profitable crop, and added considerably to the bank account of farmers.

All small fruits were the greatest crop known. Although there was great loss from too much rain during picking season of strawberries and raspberries, the market took all at good prices, the Township of Pelham easily leading in quantity of small fruits grown, one grower, Mr. Albert Railton, having shipped 375 tons, realizing a net profit of \$3,000.

I recommended last year that we should have some orchard meetings in the central and southern portion of the Niagara District. There has never been a meeting of that kind held in the section, and yet there is no section in Ontario where such meetings are more needed or where the people would appreciate them more. I therefore request that meetings be held in that section.

Division No. 9.—J. S. Scarff, Woodstock.

The year which has just closed has not been quite as favorable for the fruit growers in this district as was anticipated in the early part of the spring. The season opened with great promise of a very large crop of fruit, and just about the time the buds were bursting, on came a cold wave with heavy rains, lasting for several days. This, no doubt, was the cause for the light set of the apples. Notwithstanding this, the apple crop was a fairly good one. In many places the quality was very good, and in some places very poor, being very scabby. Northern Spy, a good sample and a good crop; Greenings, rather light crop; Baldwins, also good. Owing to the very great scarcity of barrels and boxes, a large quantity of the apples were not picked for marketing, but left on the trees and ground to rot.

The pear crop was a little under the average, and in many places badly affected with scab, Keiffer, and Bartlett being badly injured.

Plums, a very heavy crop, but rotted badly.

Cherries were a light crop. The buds in the spring failed to come out well; the quality very good.

Raspberries did well, and were a heavy crop; also the blackberries.

Peaches were not so good as last year.

With regard to our local Horticultural Society in the City of Woodstock, it is doing good work, continuing on the same lines as last year in distributing shrubs, plants, trees and bulbs to its members, also to the scholars of the public schools. During the year the Society distributed to the members 90 Hydrangeas (*Paniculata Grandiflora*) as premiums from the Fruit Growers Association, and from the local Society 185 rose bushes, 32 peach trees, 33 cherries, 66 currant bushes, 575 gladiolus bulbs, 100 cannas, 46 caladiums, and 2,826 tulip bulbs, and to the scholars of the schools 300 geraniums, and 64 boxes

of annuals, also tulip bulbs to the children, who made an exhibit of flowers at the fall exhibition of the Horticultural Society.

The Society continues to hold regular monthly meetings, and some very interesting papers were read at some of these meetings from the members.

The visit we had in April from Mr. T. H. Race, of Mitchell, who was sent by this Association, was very much appreciated by those that heard him. Mr. Race's address was on "Roses and Their Culture," and was of unusual interest to the large number who turned out to hear him, and was characterized as the best lecture on horticulture the Society had ever listened to.

Division No. II.—T. H. Race, Mitchell.

The only work worthy of notice done in this district during the year just passed has been in connection with the Horticultural Societies. There has been very little orchard planting done, not enough, in my opinion, in view of what the near future promises in the way of a demand for good fruit. Generally speaking, there has been but little spraying done, and a few varieties of apples subject to spot have been badly disfigured. On the whole, there has been a fair crop of winter apples, especially Spys, and they have been comparatively clean and well developed. It is gratifying to note that a respect for the Fruit Marks Act is becoming more and more manifest, and its requirements have been pretty well observed this fall. But while the farmers are accepting the Act and approving its aims and purposes, they are, with few exceptions, not applying themselves to the requirements of their orchards to turn the Act to good account. Those few exceptions, however, when the orchard has been properly cared for, are sure in time to exemplify the influences of the school master in the community. A few farmers I know of have made their orchards pay this fall, and their example and experience must gradually work upon their neighbors. If not, then our labor is all in vain.

In horticultural work the success of the London Society has been most marked. At the Western Fall Fair in that city in September, the special floral display made by that Society was one of the greatest attractions in the horticultural building. All the annuals shown in that splendid exhibit were grown from seed distributed by the Society, and the flowers were contributed by the members gratuitously. The general admiration of the public seemed to be a sufficient reward for the labor expended.

In the City of Stratford they have also a live and active Society, which, I regret to say, is not in affiliation with us. They are doing excellent work in giving prizes for the best kept lawn and the best flower and vegetable garden. In the latter end of August they held a flower show in the City Hall, which was a splendid success, and left them a considerable surplus in cash after paying prizes and all expenses.

In our own town, Mitchell, we have a Society with a membership of about one hundred. Of course, I consider it the best and most enthusiastic in the Province. Any meeting held under its auspices is sure of a crowded house. Last spring we distributed nearly thirty dollars' worth of plants and gladiolus bulbs, and this fall about sixty dollars' worth of Parrot tulips and mixed hyacinths. The work is showing itself very conspicuously throughout the town, in the school grounds, church grounds, public grounds, and especially about the homes. The infection, in fact, is being caught by many of the farmers, and the results are telling in the surroundings of many of the best farm homes.

Discussion.

Mr. Morris: I should like to endorse what Mr. Race has said with regard to inducing the planting of more of such stock as he speaks of—tulips, etc. Very few know how cheaply they can be got when obtained in quantities—less than \$1 per hundred.

Mr. Race: Yes, 70 cents.

Mr. Morris: They make a greater show for the money and would create a greater interest in horticultural work than anything the Societies could do.

Division No. 12.—J. L. Hilborn, Leamington.

In the district which I represent there are a number of Horticultural Societies, and they are doing good work, but there is not as much interest manifested in them as there should be. The greatest difficulty appears to be that many fruit growers and horticulturists are not sufficiently alive to advantages to be gained by diligently attending meetings and co-operating for the advancement of our calling.

One of the most important meetings held in this district was called at Kingsville in March for the purpose of discussing transportation grievances. There was a large gathering of fruit shippers. M. K. Cowan, M.P., occupied the chair, and displayed considerable interest in the welfare of the shippers. The express companies were represented by their route agents, also by Mr. Sparling, Superintendent of the Canadian Company. As a result of this meeting we got a much better service this season, but undoubtedly the express rate on fruit is more than it should be, especially to certain points.

The Mersea Agricultural Society hold their fall fair at Leamington, and manifest considerable interest in the fruit department, and annually have a fine display of fruits, in which much interest is taken, and considerable information is gained by the different exhibitors and the public generally in regard to the best varieties to grow and in the proper naming of odd and new varieties. I have for several years assisted in the judging of this department, and correcting names where wrong.

The fruit crop of 1903 was a bountiful one, but prices as a rule were rather low.

Strawberries were an immense crop, especially in Lambton County. Plums were a great crop everywhere, and so cheap that some of them were never gathered, as there seemed to be no sale for them. It appears to me that there should be sale for so good a fruit as the plum if properly canned or jammed and put upon the proper market. Perhaps there is room for the O.F.G.A. to do some good work along the line of investigating this matter, and encourage canners to handle more plums when they become so cheap, and thereby prevent a total glut in our markets.

Peaches as a rule were a heavy crop, the exception being when varieties that are susceptible to the curl leaf were not properly sprayed, and Crawford varieties that were growing on soils too sandy to be well adapted for them.

Owing to so much rainy weather during the ripening period of peaches and plums there was considerable waste from rot. The flavor and keeping qualities of peaches especially were much affected by the same cause.

Apples yielded well, but the fruit was much affected by the ravages of the scab and Codling moth. There should be much more attention given to the spraying of our apple orchards.

Much good work is being done by the Farmers' Institute in the way of impressing growers with the importance of more thorough pruning and spraying of their orchards, but there still remains room for much missionary work along those lines.

Division No. 13.—G. C. Caston, Craighurst.

In the district comprising this division the present year has been a favorable one for most varieties of fruits. Strawberries, though somewhat injured by the drought, were a fairly good crop. Raspberries, though not so good as in 1902, were yet an average crop. The blackberry has not been grown commercially in our district. With the exception of my own plantation I know of none being grown in a commercial way. And the reason is not far to seek. Nursery agents have been selling varieties that were not suited to the climatic conditions of the district. They would grow well in summer, but would lose nearly all the bearing wood during the winter, and consequently this fruit has been neglected. After a trial of some twenty varieties, I have found two that exactly suit our conditions, the Eldorado and Agawam, both of good size and quality, and producing magnificent crops, so that I have found the blackberry to be one of the most profitable of the small fruits.

Cherries were next thing to a failure this year, and plums, though plentiful and correspondingly cheap in the district near and around the Georgian Bay, were further inland only a very moderate yield. Pears, which are not extensively grown as yet, were very good in quality.

Apples were good in both quantity and quality. That universal favorite, the Northern Spy, was more than usually prolific this year, and the quality was very fine. One mistake that has been made in our district is the planting of too many fall apples and of too many varieties. Realizing this, planters are now confining their planting to winter varieties only, and only a few varieties of these. Some, acting on advice from experienced growers are taking the better plan of planting Talman Sweets and other hardy sort for the purpose of grafting them with the best winter sorts for commercial purpose, the chief of which is the Spy.

An increased interest is being taken in the growing of orchard fruits. As an instance of this I may say that the Board of Trade of the town of Orillia asked the Department of Agriculture to send some one to investigate the capabilities of that immediate locality for the production of commercial apples. As a result of this action Messrs. Creelman and McNeill were sent to that locality in the early part of the summer, and I believe their investigation proved that the best commercial varieties can be grown successfully there, more especially by the system of top grafting on hardy stock. My district is a very large one, reaching from Lake Simcoe to the Lake of the Woods. It is larger than all the others put together, and I am pleased to say that apples are being grown away north in that District of Algoma where it was not thought possible a few years ago.

In St. Joseph's and Manitoulin Islands, and in several places on the northern shore of Lake Huron, and even on Lake Superior, some of the hardy sorts are being grown, and I believe that there is a strip of country reaching the whole length of the north shore of Lake Huron to Carden River a few miles wide that will grow a great many of the varieties that we are growing in the more southerly sections. As the result of a meeting held in Toronto of the Board of Control and experimentalists, a move has been made toward having some experiments in fruit growing conducted in New Ontario, chiefly in the Temiscamingue country. I attended a number of orchard meetings in our district in company with Mr. McNeill in April. These, where properly advertised, were well attended, and an interest manifested that will, I hope, lead to some practical and profitable results. Mr. McNeill explained very fully at each meeting the commercial side of fruit growing, and we quite hope that co-operative marketing will be one of the features of the future industry in our section.

FRUIT NOTES.

By C. L. Stephens, Orillia.

Although not having any official connection with your Society requiring that I make a report thereto, yet because of the very great interest which I take in the work carried on by the Association, and by virtue of my connection with the Horticultural Society of this town, I crave the liberty of hoping that what I have to say about fruit-growing in this district may be of some interest to your meeting. I, therefore, give a brief sketch of my experiences in fruit matters during the past years:—Early in the spring we were favored with a visit from Mr. A. McNeill, Vice-President, and Mr. G. C. Caston ex-President, who held orchard meetings at several places in the district, and their lectures and practical illustrations in pruning, etc., proved most acceptable. Later on Mr. T. H. Race, by invitation of the Horticultural Society, visited us and an evening meeting was held for him at the residence of Mayor McCosh. Mr. and Mrs. McCosh placed their commodious reception rooms entirely at our disposal, and were

most kind in promoting the success of the meeting. Mr. Race was "himself," and spoke most instructively and entertainingly for nearly two hours, and the discussion which ensued showed that he had enlisted the sympathy of his hearers in the cause of civic improvements. It was regretted that many other attractions on the same night caused rather a small audience for Mr. Race, but amongst the ladies and gentlemen present were some of the most progressive and thoughtful of our citizens. Our local Board of Trade has during the last year developed an interest in the apple growing industry, and on their invitation your Vice-President and Secretary visited the district about blossoming time, spending nearly a week here, and in company with myself or some other member of the Board of Trade visited, by pre-arrangement, many of the orchards within ten or twelve miles of the town. A close arrangement was made as to the different varieties of apples grown, the condition and hardness of the trees, etc. A number of neighboring fruit growers were always assembled. All were glad to talk of apples, and the prospects of growing them on a commercial scale, with profit to themselves, and with the effect of broadening the vision of the visitors as to the area in which first-class commercial apples may be grown. Towards the end of September Mr. McNeill and myself spent another day amongst the orchards and saw the fruition of the hopes of spring; and I think Mr. McNeill was entirely confirmed in the favorable opinion his spring experience had given him. He has promised a report on the subject, which will be of much interest to the fruit growers up here. Mr. T. H. Race was at our F. I. Fair on Sept. 1st as judge of fruits. The exhibit was large and very fine, and I think Mr. Race was duly impressed; although, owing to the early season of the year, the apples had not then attained to nearly their full size and color. I am sending, to help the exhibit at your meetings, a case of winter apples, which cover nearly all the varieties at present grown here, and which represent the average size and general appearance of these apples as we grow them; not selected for extra size, but just average. During the past month I visited a good many orchards in this "Orillia District," and from observation have formed the opinion that all of the more valuable winter apples can be grown here, if not as procured from the nursery yet by top-grafting upon hardier stock. Thus I have seen heavy crops of very fine "Kings" grown upon "Duchess" stock, and so far as I observed upon "Duchess," only. This, I think, is following out a suggestion thrown out by Mr. Caston at your annual meeting in this town some years ago. This has been so far successful, but I think some equally hardy stock, with a more vigorous growth would be better, as I find the "King" top has a tendency to outgrow the less vigorous stock. Indeed, in one orchard I found, chiefly from this cause, and a heavy load of fruit, fine trees had been completely broken down and destroyed; and had I not been careful to tie up the laden branches, my "King" or "Duchess" would have met a similar fate. I found that nearly every orchard had from one to a dozen or so "Northern Spy" trees growing on their own stock and doing well, some of them as much as thirty years old. Several farmers claimed to have "Baldwins" and "R. I. Greenings," but I found none of the former, and but one tree of the latter, and it was doing well and had a good crop of fine fruit. It might be well, notwithstanding, to recommend the top grafting of Spy, Baldwin, and R. I. Greening, as well as King, on some hardy, robust stock, the Talman Sweet would, I presume, answer the purpose well. Just here I might say that the farmers about here have great and just cause to complain of the manner in which they have been treated by nurserymen or their agents, or both; against the agents for recommending varieties that will not grow, or if grown are of no value, and against the nurserymen for not sending trees according to name or order. By these means, I have no hesitation in saying that the farmers of this district have been defrauded of thousands of dollars, and the country now is filled up with a lot of utter trash in the shape of apple trees, thus foisted upon the farming community. Twenty years ago, I was fooled in this way myself, and I find the trouble still going on every year, young trees coming into bearing showing worthless fruit; for instance, a neighbor asked me this fall to take a look at half a dozen young "stocks," which were bearing their first apples, and, as he said, doing

finely ; it needed but a glance to assure me that his "fine stocks" were but worthless Haas ; and so on ; I could tell many similar tales. Now, sir, is not this a question which your Society might well consider and deal with in some effectual manner, so as to prevent this continual cheating of the farmer by the nurserymen. I do not mean to infer that all nurserymen carry on these disreputable practices, because I know, and everyone knows, that some of our nurserymen, and even their agents, are honorable in all their dealings. I find most of these mistakes (?) to occur with trees coming from the United States. To carry on many businesses and professions in which the well-being and comfort and, I might say, well-doing, of the community is at stake, a license is necessary ; I think a license to sell fruit trees might fairly be a condition required for anyone engaging in the business. I was present at the Bracebridge Fall Fair and there, again, I found a very fine exhibit of apples, including Duchess, Wealthy. Ben Davis, several Russets, also some of the Russian Apples, and crabs in great variety. There were also several seedlings, some of which were doubtless of local value. The apple crop of Southern Muskoka is yearly increasing in volume and value, and whatever success has been attained in the matter is largely due to the efforts of Mr. J. P. Cockburn, of Gravenhurst, who has been for many years engaged in experimenting with named apples and seedlings, and has freely given of his experience for the benefit of his neighbors ; I had the pleasure of meeting Mr. Cockburn for a few minutes when passing through Gravenhurst.

I am afraid my brief remarks have spun out to rather "a length," but it's just a case of a man's pen running away with his sense of propriety. In conclusion, I regret very much that I am unable to be present at your meeting, but hope that if you meet in Toronto next year I shall be with you.

REPORT OF MR. THOS. BEALL, LINDSAY, HON. DIRECTOR.

I have the honor to submit herewith a brief report of some of the circumstances relating to the fruit industry in this northern portion of Division No. 5, and may be considered as supplementary to Mr. Rickard's able report, which refers principally to the southern part of this Division.

The success or non-success of horticulturists,—after exercising intelligently all the skill they possess,—depends largely on the climatic conditions prevailing in their locality, especially during the six months from the middle of April to the middle of October : The variability of the weather of the past season in this northern section of the district has made greater demands upon their store of knowledge and upon their skill in protecting their crops in changeable weather, than perhaps during any previous season for a generation.

For about ten days before the middle of April the weather has been warmer and drier than usual, consequently the soil was at that time in fine condition for working and most persons in this locality got in their early vegetable seeds a week or ten days earlier than usual. Much farm and orchard work was also done before the end of the month. The weather during all that time continued warm and mostly dry. The total depth of rain which fell from the 6th to the 30th of April being only .53 inches, and the max. temperature on this last of April 76.6 degrees. In the evening, however, of that day a great change took place, and as much rain fell in a few hours as had fallen altogether during the previous twenty-four warm, beautiful days. On the following morning, May 1st, the temperature had fallen to six-and-a-half degrees below the freezing point and on the next morning a half a degree lower.

On Monday morning, May 4th, what a change had come in the prospects of the horticulturists here ! On the previous Thursday a few of the earlier strawberry plants were in bloom. The blossom on currant and gooseberry bushes were falling and the young berries partially set. Raspberries looked beautiful. Plums also gave great promise, and the prospect for a bountiful supply of apples and pears had never been

better. But now : the strawberry crop is injured to some extent. Currants and gooseberries more or less formed, are, to the extent of one-half of the crop on the ground. Raspberry bushes stand with bowed heads ; there will be but little fruit, perhaps none. Plums will certainly be a total failure. Grapes, when uncovered, will be greatly injured. My own are covered, and are safe for the present. The quantity of apples and pears will be greatly diminished, especially the earlier varieties.

Such was the fruit prospect at the beginning of May. We now find that the severity of the weather at that time may well be described as a "blessing in disguise." A few only of the earlier varieties of strawberries were injured, and most of our growers never had a better crop. Currants and gooseberries were about one-quarter of a crop. Raspberries less than one-tenth. Plums a total failure. Grapes, an average crop when covered. Apples and pears are an excellent crop, and the cleanest produced in this locality for many years. There is but little spraying done here, yet this season there is scarcely any loss occasioned by insect pests of any kind, and the loss by scab, although great, has been but little as compared with former seasons.

The value of the fruit crop as a whole in this northern portion of Division No. 5 is much greater than for any season heretofore ; and I have no doubt but the severe frost on the 1st and 2nd of May was the chief factor in producing this result. The very long cool summer with the unusually late "first frost," which occurred on 24th October, was also probably contributory.

COMMITTEE ON RESOLUTIONS.

On the motion of A. McNeill, seconded by M. Pettit, Messrs. Tweedle, Hilborn, Thompson, Peart, and McNeill were appointed a Committee on Resolutions.

NOMINATING COMMITTEE.

The Nominating Committee was appointed by the President as follows : Messrs. Caston, Jones, and by the meeting, Messrs. Lick, Race, and M. Pettit.

COMMITTEE ON FRUIT EXHIBIT.

Messrs. W. T. Macoun, Professor Hutt, and L. B. Rice, Michigan.

Mr. Creelman moved, seconded by Mr. Scarff, that rule 24 of the Constitution be suspended so as to permit the Committee on Nominations to report immediately after dinner. Carried.

REPORT OF NOMINATING COMMITTEE.

The report of the Nominating Committee was adopted, with slight amendments. See page 4.

DIRECTORS' MEETING.

The newly-elected Board of Directors met at the close of the evening meeting on Wednesday, Nov. 25, all members being present.

The President, W. H. Bunting, on taking the chair, suggested that W. A. MacKinnon, Chief of the Fruit Division at Ottawa, be made an honorary director, as his advice and assistance from a commercial point of view was likely to be valuable to the Board.

Some discussion ensued as to the power of the Association to add to the number of its Directors under the Act. The conclusion reached was that, while Hon. Directors

might properly be appointed by the Board, they would not be entitled to vote on matters involving the expenditure of the funds of the Association.

T. H. Race moved, seconded by Wm. Rickard, that W. A. MacKinnon be made an honorary director in an advisory capacity. Carried.

A. McNeill moved, seconded by G. C. Caston, that G. C. Creelman be reappointed **Secretary of the Association** at a salary of \$500 per annum. Carried.

Messrs. Thos. Beall, Lindsay ; A. M. Smith, St. Catharines ; W. T. Macoun, Ottawa, were reappointed Honorary Directors of the Association.

Some discussion took place as to the practicability of making the appointment of honorary directors permanent instead of re-electing same from year to year, and the Secretary pointed out that there was nothing to prevent their being elected during good conduct, whereupon it was resolved, on motion of Mr. McNeill, seconded by Mr. Whyte, that the appointment of honorary directors should be considered permanent.

Annual Meeting for 1904.

The Secretary read the following letter from the President of the Toronto Horticultural Society, inviting the Association to meet in Toronto in 1904 :

Toronto, November 21st, 1903.

To the Directors of the Ontario Fruit Growers' Association, in Convention at Leamington :

Dear Sirs,—On behalf of the Toronto Horticultural Association, I beg leave to invite you to hold the next annual meeting of your Association in the City of Toronto.

Toronto has for some time been known as the "Convention City." The hotel accommodation, the easy access from place to place, the central location of the city and the ease with which it is reached from all other parts of the Province, make it a desirable place for delegates to meet together.

It is also the custom of the Toronto Horticultural Society to hold a flower show about the time of your annual meeting, and it is possible that we could co-operate with you to our mutual advantage.

In speaking for the officers and members of the Toronto Horticultural Society, I might say that we would do all in our power to make your annual meeting a success, and trust that when the time comes you will see fit to bring your convention to the "Queen City."

Yours very truly,

Sgd. Edward Tyrrell,

President.

The Secretary further stated that he had received a telegram from the Mayor of the City of Toronto as follows :

"On behalf of the City of Toronto, I extend a hearty invitation to the Ontario Fruit Growers' Association to hold their next annual meeting in Toronto."

Sgd "Thomas Urquhart,

Mayor."

In presenting the matter, the Secretary said that the holding of the meeting in Toronto would give the Association an opportunity to co-operate with the Toronto Horticultural Society, which held an important floral exhibition at that season of the year. This would be an interesting feature to delegates from Horticultural Societies, and should stimulate their attendance. He suggested that the Association should co-operate with the Toronto Horticultural Society and also make a large display of winter apples, securing a hall of sufficient size for the purpose. This, he thought, might be developed into a sort of Winter Fruit Fair, and that some assistance might be obtained from the Government towards this object.

E. Morris: The best meetings of the Association have always been held in Hamilton, and it seems to me that that would be a more central place for the great fruit section.

A. McNeill suggested that an exhibit of orchard implements should be added to what had already been suggested. Mr. Caston favored holding the convention in Toronto.

On motion of Harold Jones, seconded by Murray Pettit, it was decided that the next annual meeting should be held in the city of Toronto.

In regard to a Winter Fruit Fair, it was suggested by Mr. Caston that the matter be left with the Executive, and on the motion of Mr. Race, seconded by Mr. Caston, it was decided to leave it to the Executive to formulate some scheme and to make an estimate of the cost and submit it to the directors by circular, so that a decision might be reached at the time of the Toronto Industrial.

The President: Inasmuch as the Report of the Executive referred to a change of policy in reference to the Horticulturist, I would suggest that the Secretary read that portion of the Report.

The Secretary read the portion of the report referred to.

The President: In addition to what the Secretary has stated, I may say that it has appeared to me for some time back that it is very desirable, in fact, absolutely necessary, that our magazine should be placed upon a paying basis. This apparently has not been the case in past years. The grant we have received from the Department has to a very large extent been absorbed in the publication of our magazine, and in consequence we have to a large extent been cramped for funds to conduct the affairs of the Association. I understand that some three years ago representations were made to the Department, in view of this fact, and an increased grant asked for. The Minister did not see his way clear to accede to the wishes of the Board under the circumstances, and no increase was made. It is for you to consider whether anything can be done to put the magazine on a profitable financial basis.

Mr. Race: It would appear from the financial statement that the Horticulturist has been paying its way, judging from the amount received in membership fees.

The Secretary: That does not include a number of items given below for illustrations, etc.

The President: Nor the salary of the editor; the first item is simply the cost of publication.

Elmer Lick: There has been a decided improvement in the paper, and if it is possible to make it still more attractive, the sooner it is done the better.

Harold Jones: It would be of value if Mr. Owen's address and discussion could be published in the Horticulturist at no distant date.

The Secretary stated that he had met with great difficulty in securing advertisements for the magazine in its present form. It was too much of a parlor magazine. It should, he thought, take a more up-to-date form, and the size should be increased, so as to admit of a great deal of valuable material, which came to his office from time to time, being published. "At its last annual meeting, the Canadian Press Association discussed what the weekly papers could do for agriculture, and I suggested that my office could supply them with a great deal of material that might be used in that way. They accordingly proposed to the Minister of Agriculture that someone should be placed in the office who could undertake this work. We now have a suitable man in view, and the Minister would doubtless allow us to use part of his services in connection with the Horticulturist. I am willing as Secretary to undertake to make these improvements, knowing that the responsibility will, to a large extent, fall upon me, if you will give the Executive power to make such changes as they may see fit in the Horticulturist."

L. Woolverton: I want to support what Mr. Creelman has said. I think he has spoken in the right direction. I know that it is very hard to get advertising patronage, and believe that papers published in large centres of population always appeal to

the advertiser more than a journal that is issued in a small place. I think on that account it might be wiser to publish it in Toronto rather than in Hamilton. I think that if Mr. Creelman's ideas were carried out, and the business management put into the hands of someone who was working in that direction all the time, enough money could be made to make the journal pay for itself, including the salary of the man who is to be employed upon it.

After some further discussion as to the style and size of the magazine, it was moved by Mr. Caston, seconded by Mr. Hilborn, that the matter be left with the Executive, with power to do what they thought best, with the view of improving the journal. Carried.

W. T. Macoun suggested that the Horticulturist should unite with the journal issued by the Dominion Forestry Association, and the Secretary read a letter he had received in that connection from the Forestry Association, as follows:

Ottawa, Nov. 23, 1903.

Dear Sir,—I beg to acknowledge the receipt of your letter of the 21st instant, in which you suggest the idea of our making some arrangement with the Fruit Growers' Association to have a joint publication for the two Associations. In reply I beg to say that this matter would have to be considered by the Board of Directors of our Association before anything could be done, and as it would be impossible to have a meeting before your Leamington meeting, I am unable to say anything with reference to the proposal. In any case, I do not think that it would be possible to make an arrangement to commence at the beginning of the year. We have been considering the idea of publishing a quarterly periodical, and this was discussed at a meeting of the Directors held last week, but so far the matter has been referred to the annual meeting to be held in Toronto in March next. I need not say that the members of the Canadian Forestry Association look upon the Fruit Growers' Association as a kindred society, with which they should exchange views and give mutual assistance as far as possible; and they would be pleased to have representatives from your Association at the annual meeting.

Yours truly,

(Signed) E. STEWART,
Secretary.

New Building and Prize List Committee for the Industrial Exhibition, Toronto.

On the motion of Harold Jones, seconded by A. M. Smith, Messrs. Race, A. McNeill, President W. H. Bunting, and Secretary Creelman were appointed a committee to take up the question of the requirements, specifications, etc., of the new building for Fruit, which it was proposed to erect at the Dominion Industrial Exhibition, Toronto, with the representatives of the Exhibition Association, and also to revise the prize list in regard to fruit.

THE EVENING MEETING.

In the evening a public meeting was held in the Town Hall. W. H. Bunting, President of the Association, occupied the chair, and spoke a few words of welcome. The hall was crowded, among the audience being a great number of ladies. The Leamington orchestra contributed several selections that were much enjoyed. The platform was draped with Union Jacks and Stars and Stripes.

Mayor Lewis Wigle extended the welcome of the town to the delegates. He spoke reminiscently of the olden days in Ontario, and said that the Association could not have held its first meeting 28 years ago in Leamington, because then there was no Leamington, nor were there any railroads to reach the district. He referred at some length to the fruit industry of Ontario, of which the most important district was that

extending from Niagara to Essex. Leamington itself was the most southerly town of Ontario, and in his belief and that of his fellow-townsmen, the most favorably situated for fruit-growing.

John Auld, M.P.P., of Amherstburg, welcomed the fruit men on behalf of the county. He explained that the Government were doing much to assist the farmers in fighting pests and express companies. Everyone admitted that Essex was the fruit garden of Canada. There were many other flourishing industries in Essex; among these he mentioned the oil, wine, tobacco and general farming.

M. K. Cowan, M.P., of Windsor, spoke of the difficulty last summer between the fruit growers of Essex and the express companies. The meeting between the express companies and the growers, held to discuss this matter, had resulted in much good. Fruit had not long been the staple product of this country. Ontario was only a new fruit country. They must do the best they could, and when their product was increased they would be able to demand and exact a cheaper and better express service. Essex was probably the most favored part of Ontario. It was favored as the corn belt, the fruit belt and the tobacco belt. There were more sunshiny days in Essex during the tobacco-growing season than in Kentucky. The farther north you could grow a fruit, moreover, the better it would be, and for this reason Ontario fruits were hardy and of splendid quality.

L. B. Rice, of Port Huron, Mich., a delegate from the Michigan Horticultural Society; J. Elliott, M.A., Principal of the Leamington High School; G. W. Cady, President of the South Essex Horticultural Society, and J. L. Hilborn, President of the Leamington Horticultural Society, added their words of welcome to those of the previous speakers.

W. H. Rickard, M.P.P., of Newcastle, replied to the addresses of welcome, on behalf of the Association. He laid stress upon the necessity for developing the British market for Canadian fruit.

PRESIDENT'S ADDRESS.

By W. H. Bunting, St. Catharines.

I desire first of all to express my appreciation of the honor conferred on me last December in my election to this responsible position, and to tender my hearty thanks to the officers and directors, and more especially to our energetic Secretary-Treasurer, for their hearty co-operation with me in the affairs of the Association during the year.

In reviewing the course of events of the year just closing, I am free to confess, that it would have been quite easy to have entrusted this office to hands far better qualified and more competent than my own to discharge its duties creditably and in a satisfactory manner. However, as I was not responsible for the error in judgment in the selection made, and am not conscious of any culpable neglect of duty, I can now restore the trust without any vain regrets as to wasted opportunities or a wilful disregard of the interests of the Association.

I am very glad to state to you in a general way what has been brought out more fully and in greater detail by the Secretary in his report; that the year has been one of progress and advancement upon lines of work laid out by the Executive and Directorate of the Association, in connection with the educational Campaign carried on throughout the various fruit-growing districts of the Province.

I trust at this annual meeting some action of importance with reference to the general policy of the Association may be taken that will tend to maintain our position in the front rank of the Agricultural interests of this magnificent heritage of ours, the Province of Ontario.

In the years that have gone by, it has been customary in this address at times to indulge in some reminiscences regarding the early struggles and triumphs of the Asso-

ciation. We are approaching the half-century mark of our existence as an Association, and have passed the quarter-century mark in the history of our magazine, and I believe that I am right in stating that there is only one gentleman, who is with us to-night, that can claim to have taken an active part in the organization of this Association away back in the early sixties. I refer to our respected friend and enthusiastic horticulturist, Honorary Director A. M. Smith.

While our Association has had its vicissitudes and its struggles, its progress has been ever onward and upward, and it has stood during all these years for whatever was for the greatest good of the fruit-grower, whether his acres be many, or only the modest town lot, and throughout our broad Dominion there is not a tiller of the soil, there is not an artisan or mechanic, there is not a merchant or manufacturer, there is not a single individual, no matter what his position in life, but to a greater or less extent, is under obligation to this Association for much that adds to the beauty of his home surroundings and to the comfort and health of his family life. The immense strides that have been made in the beautifying of town and country places, and in the vast increase in the production of the many and varied fruits, throughout this country, are largely due to the earnest men and women who have been connected with this Association, and who have drawn inspiration from the annual meetings held in the various parts of the Province from time to time, and who have gathered knowledge from a perusal of the reports of the addresses delivered at these meetings, from the work of our experimenters, and last, but not least, from the columns of the *Canadian Horticulturist*, so ably conducted by our editor, Mr. Woolverton.

These facts are, however, known to most of you, and it is quite unnecessary that I should enlarge upon them at this time. Permit me, however, to express the hope that we may not rest on the laurels and traditions of the past, but that, enthused by what has been accomplished by those who have guided our Association so wisely and so well, we may be able to take higher vantage ground in the future, and make our influence felt not only in legislative halls, but also in the councils of the great transportation companies, and with the powerful consolidations of capital that are absorbing so many of the avenues for the disposition of the products of our orchards and vineyards, in such a way as will secure even-handed justice to each and every member of this Association in his business relations with the public.

It will not be out of place here on behalf of the Association to tender to the Minister of Agriculture our appreciation of the kindly interest he and the officials of his Department have continually taken in every movement that has had for its object the advancement of horticulture in this Province, and the substantial manner in which that interest has been manifested from year to year as circumstances have warranted. We believe that we have in the Hon. Mr. Dryden a gentleman who is thoroughly in sympathy with the agriculture of the Province, and who is eminently well qualified for the position which he so ably fills.

Gov. Odell, of the State of New York, observed in his address at Niagara Falls before the Farmers' National Congress a few weeks ago that Government financial assistance to the agricultural interests of the country was not paternalism, but tended to develop and encourage good citizenship in the broadest sense of the term, and was a proper and legitimate use of the public funds. Our Provincial Department of Agriculture has fully realized this principle in the past, and it remains for us to provide proper channels for development and progress and to lay our plans before the Department in a businesslike way, when I have no doubt our requests for further financial aid will receive careful consideration.

During the past year a new horticultural organization has been formed, called the Canadian League for Civic Improvement. While this is a separate and distinct organization, arrangements have been effected whereby this Association is represented on its Board of Management, the *Canadian Horticulturist* has been selected as the official organ of the League, and a special department has been set aside for its use. We will be glad to welcome their Hon. Field Secretary, Mr. G. R. Pattullo, to this annual meeting,

and will no doubt listen with a great deal of pleasure to his address on the aim and work of the League.

The time has come in the history of the Province when a great deal more attention is being paid to the improvement and beautifying of our home surroundings and the public places in our towns and cities than heretofore, and in this good work every member of our Association is called upon to take a part.

We have spent years in learning how to grow good fruit and to produce plenty of it, in securing and disseminating the best and most profitable varieties of all kinds of fruit, and that we have succeeded in so doing goes without saying. Notwithstanding the many and varied obstacles that have stood in the way, and the many unforeseen discouragements that have encompassed the path of the fruit-grower, the past season has again conclusively proven that we are able to produce under ordinary circumstances an abundance of fruit for all the demands of our broad Dominion.

The question of production is not now the one that confronts us, but prompt and efficient distribution to the various parts of the Dominion where needed, at a reasonable cost and in a careful manner. To this problem our Transportation Committee in the past two or three years has given considerable attention and thought. The result of their efforts has been of considerable benefit to the large commercial grower, but not so much to the smaller producer. It is hoped, however, that with the appointment of a Railway Commission, a step that this Association has strongly urged for several years, and through its Transportation Committee forcibly brought to the attention of the Government last winter, that such representations may be made to the Commission as will lead to a very great improvement in the carriage of fruit, both as to rates charged and service rendered, which will result in Ontario fruits going in ever-increasing quantities to the important markets which are opening up in Manitoba and the Northwest, as well as to the more northerly parts of our own Province, to say nothing of the large and important export trade over the sea.

There is perhaps no question of such interest to our members to-day as the great problems of distribution. How to organize and co-operate to accomplish this object is a live and burning question in the minds of hundreds of earnest practical growers at the present time. When, during the past season thousands of baskets of beautiful fruit have been left to hang and rot on the trees, from lack of proper facilities to place them in the hands of those who would gladly have purchased them at a fair price, and when thousands of barrels of apples have also been wasted or disposed of at a fraction of their real value for want of suitable packages, while at the same time a Macedonian cry was heard from the mother country for all the fruit we could possibly send her, it is certainly time for this Association to be up and doing and to endeavor, in some way to elaborate a plan, whereby these unfortunate conditions may not continually recur. I am glad to say that the germs of co-operation have gained a foothold, and a good beginning has been made in some sections. We have also with us to-night a gentleman from our cousins to the south, who has had considerable experience in co-operative organization, and who will no doubt be able to give us much valuable information in this respect.

A word or two with reference to general conditions during the past year. We have cause to congratulate ourselves that we have experienced a year, when the promise of the spring has been abundantly fulfilled in the harvest of the summer months. All kinds of fruit have been produced in abundance and of good quality, and even our standard fruit, the apple, which gave us such a large production in 1902, has surprised us with a generous supply again this year. While prices have in some cases been very low and cost of handling and transporting correspondingly high, still on the whole the average grower has cause to express his gratitude to Him who gives the early and the latter rain, and who brings to perfection the beautiful products of our orchards and gardens.

It has also been fully demonstrated again this year that it is quite possible to cope in a scientific way with the insects and fungous pests that cause the fruit-grower so

much annoyance and loss. Our members will do well to inform themselves thoroughly on the best appliances and the most up-to-date methods of dealing with those troubles, and, having gained the information, attend diligently to putting it into practice, a work for which they will be well repaid.

I thank you, ladies and gentlemen, for the hearing you have given me, and I trust that our meeting here in Leamington may not be without its value to the residents of the town and surrounding country, and also may result in great good to fruit-growers generally throughout the Province.

ADDRESS.

By Dr. James Mills, President, O. A. C., Guelph.

Fruit-growing is one of the most interesting and ennobling branches of farming. It appeals to educated, refined people. Of the various sections of the farming community in this Province,—and I think I know something about them, the most intelligent and progressive sections, in my judgment, are the fruit-growers and the stock-raisers. I think that would be borne out by evidence that could easily be collected by one visiting the different parts of this Province. I do not see how a man who spends his time growing fruit, or more especially growing flowers, could be a coarse or ignoble man. I think, there is no more honorable or interesting occupation.

Ontario is especially fortunate as a Province in the fact that it can grow a great variety of fruit of most excellent quality. I doubt whether there is any Province or State on this continent that can grow a greater variety of fruit of first-class quality. It is due to this fact, I take it, that we made such an excellent record in Philadelphia and Chicago, and more recently at Buffalo. We stood first at Chicago and second at Buffalo, New York State being first. I think this was due to two things; first, that we can grow a great variety of fruit, and second, that the farther north you can develop anything to perfection, the finer the quality you will have.

It is true that we have many fine orchards in this Province; but any man who travels through the Province and looks right and left, and thinks, will be forced to the conclusion that we ought to have ten orchards where we now have but one. I cannot understand how it is that we have not more first-class orchards, considering the fact that we can grow such excellent fruit, with even moderate care, in almost any part of the Province. How is it that we have not more first-class orchards? If we had more our farmers would be better off.

In conclusion, I wish to call attention to four or five of what I consider the most urgent needs in connection with the business of fruit-growing in this country:

First, attention to the varieties of fruit that our farmers and fruit-growers are spending their time on. The report comes from home and abroad that we have too many varieties of the various classes of fruit. The fruit inspectors at Liverpool are advising the shippers not to send so many varieties, but rather to keep to a few varieties of acknowledged merit. That is what the markets everywhere seem to want. One may, of course, have two or three trees of several varieties for home use; but if he is going to sell his fruit, he should confine his attention to five or six of the best varieties of autumn and winter fruit. I think there is need for a move in that direction.

The second urgent need that I will mention is attention to packages. I was rather surprised to hear your President say in his address that in the matter of providing the right kind of package, we are behind our neighbors across the line. I ask, why? Have we not the industry and intelligence to devise a suitable package? For every fact, there is a cause. The President said there were thousands of barrels of apples that rotted on the trees or were disposed of at a small fraction of their value this year, because of a lack of suitable packages. Is there not sufficient trade in this Province to warrant anybody in manufacturing the right kind of box? or have not the fruit-growers

themselves come to any definite conclusion, so as to be able to say exactly what they want? The matter was discussed at your convention last year; and there seemed to be a great difference of opinion. I think it is time you came to a conclusion upon this important matter.

Third, Spraying: There is the greatest need of more attention to spraying. It is difficult, I find, to buy a barrel of Snow apples that are free from scab. I bought two barrels a little while ago, after trying half a dozen places; and three out of four apples in the barrels were badly affected. I give this as an illustration of the seriousness of the trouble. If this Association can only do something to burn the need for proper spraying into the minds of the farmers, it will have done a great good. Much of the spraying is spraying only in name. Spraying has to be done well to accomplish the desired results. If farmers want to make anything out of their orchards, they must do more and better spraying.

Fourth, Transportation: This is the most important matter of all. Mr. Cowan said that the fruit-growers had "been fighting pests and express companies." I was struck with the expression; and I think they will have to fight still more vigorously. If this Association has before it any one question that is of primary importance, it is the question of transportation. If what you say be true,—and you men ought to know,—that one-third to one-half of what you receive for your fruit is taken by the express and railway companies, it is indeed a very serious matter. Surely there are fruit-growers enough in this Province to present the case strongly and clearly to the transportation companies and make them understand that it is necessary that your fruit should be promptly carried, and carried at a reasonable rate. But you have got to wake up on this question. Not long ago I had some experience myself. I bought a basket of fruit in Hamilton, for which I paid thirty cents; and what do you think I paid to have it delivered in Guelph, about 30 miles distant?—35c. The time is at hand when you should say to the Government that you must have reasonable rates from express companies, or have an express department in connection with the postal system of the Dominion. I have felt for some years that we ought to add a parcel department to our postal system. (Applause.)

This matter of transportation is one that you should call upon your representatives in Parliament to take up. The railway companies have enormous power; but every man sent to Ottawa has a power also, and should make himself felt; and personally I feel that I cannot impress upon you too strongly the necessity to deal promptly and directly with your representatives in Parliament. Compel them to take up the matter; and let them feel that they have the people behind them in their demands.

THE CANADIAN LEAGUE FOR CIVIC IMPROVEMENT— ITS PLANS AND PURPOSES.

By the Hon. Field Secretary, Major George R. Pattullo, of Burnside, Woodstock.

Civic improvement is a natural sequence and complement of educational material and municipal growth. The first public duty of our Canadian forefathers, a century ago, was to establish Municipal Institutes. These were essential to provide the common public necessities of pioneer life. The community must be organized. It was not enough that the settler should slash down a "clearing" for himself in the "Queen's Bush": that he should build thereon a log house to shelter his family, and erect a rude "shack," or shed, in which to house his stock, but, as a citizen of a new community, he was also in duty bound to aid in general public improvement, to help blaze trails through the bush, as a means of communication between settlers, and subsequently to organize Municipal Councils, school boards, churches, and agricultural societies, and through these agencies to levy taxes, make roads, build bridges, erect school houses, secure teachers and preachers for the schools and churches; and thereby lay the foundation of general progress and prosperity. These were the very rudiments and essentials of early settlement. They constituted the topics for public discussion at the early "town meetings,"

"logging bees," "barn raisings," and elsewhere; and they engaged the attention of Municipal Legislators and local authorities generally.

Great progress in many directions has been made in the meantime; nevertheless, for over a hundred years from 1793, when what may be called the first Municipal Act was passed, the people of Ontario have been chiefly engaged in providing for themselves the material necessities of life, establishing upon a firm and liberal basis Municipal and Parliamentary institutions, organizing and improving an efficient system of education, and establishing and maintaining religious institutions, to meet the varied wants of a mixed community. Nor have we as their descendants much fault to find with the way in which this work of our forefathers was done. All of them did not enjoy the educational advantages necessary to qualify them for efficient public services; but they were usually honest of heart and meant well. They made mistakes, but even if they had made none, the work done by them in the past would not suffice for the demands of to-day. Time has wrought wondrous changes. Railways, telegraphs, telephones, gas, and electric lighting and an infinite number of labor-saving machines, on the farm and in the factory, together with the application of more skilful and scientific methods in our agricultural and industrial life, have united to revolutionize economic and social conditions, and have brought us face to face with new duties and wider responsibilities. We have entered upon a new century of progress. The limitations of the past will not meet the demands of the present, nor satisfy the aspirations for the future. New conditions impose new responsibilities. The Ontario of to-day is not the Upper Canada of 1849, nor is the Dominion of to-day the Canada of 1793. The civic horizon has been broadened, and the civic spirit of the future must be alike higher and broader than was that of the past.

In recognition of this changed condition, a recent meeting was held in Toronto at which prominent representatives from many parts of the Province were present, and there was organized a "Canadian League for Civic Improvement." The League is composed of ladies and gentlemen, who are interested in civic reform and are willing to contribute of their means and time to promote it. The work of all its officers, directors and members is done voluntarily and gratuitously.

The chief objects of the League, in brief, are to promote a higher civic spirit and a wider interest in the improvement and beautifying of our cities, towns, villages and rural districts. The League also seeks to secure the assistance of ladies and gentlemen and the co-operation of all organizations that are interested in the promotion of these objects. The League is anxious to be of service to all, and to antagonize or displace no existing organizations that are efficient. It recognizes the splendid results that have followed the work of Ontario's Agricultural College in its several branches; of the Dairymen's Associations; Farmers' Institutes; Bee-keepers' Association; Agricultural and Horticultural Societies; Fruit Growers' Association; Stock Breeders' Association, and many others, whose united work has given the Province its present progressive, and, indeed, premier position. But while paying just tribute to all these organizations, whose objects chiefly concern the material progress of the Province, is it not time that our attention should be turned occasionally and at least to some extent from the mere necessities to the aesthetic surroundings and comforts and it may be also the luxuries of life? It is not enough that so progressive a Province and so prosperous a people should have merely comfortable homes; they should be homes of culture as well. The country, naturally beautiful, should be made still more beautiful—beautiful for all its people—not less than fruitful. Nature has done much for it, but nature aided by art could do something more. There should be more out-door art and also more art within our homes. The field thus suggested is a very wide one, and may profitably engage the united efforts alike of Parliamentary and Municipal bodies, of Boards of Trade, Boards of Health, Farmers' Institutes, Agricultural Societies, Dairymen's Associations, Horticultural Societies, Art Leagues, Landscape Gardeners, Park Commissioners, College and School authorities, and, indeed, all other organizations that have for their object the betterment of society. All of these, supported by a sympa-

thetic people, should co-operate to the same end; the creation of a higher civic spirit, the improvement of civic conditions, and the making of our Province and Country a more pleasant and attractive, not less than profitable, place in which to live.

Something has already been done in this direction, but much yet remains. Let me suggest some of the directions in which such efforts may proceed.

In Cities, Towns and Villages.

Civic improvement in cities, towns and villages may include better streets, more tree planting, well-kept boulevards, more and better-kept parks and play grounds, improvement of public buildings, school houses and churches by more general use of vines, ivy or climbers, more artistic grounds about all of these buildings, and a more general planting of shrubs, trees and flowers therein, the erection of statues, the providing of fountains, public lavatories and closets, public gymnasiums and rest rooms, cemetery improvement, improvement of railway station grounds, planting of trees and flowers around factories, improvement of vacant lots, lanes and alleys, a greater attention to public sanitation, a perfect sewage system, improved facilities for the disposition of garbage, more artistic public advertising, simplicity in naming streets and numbering houses, fruit and flower exhibitions, cleansing public buildings and public vehicles, a higher class of pictures in our public halls and our various public institutions, improved municipal architecture, including all public buildings and bridges, compositions and awarding of prizes to stimulate home-planting among the school children and citizens generally.

In Rural Districts.

Civic improvement in rural districts may also cover nearly as wide a field. It includes better roads, more drainage, better fences, more general tree-planting, evergreens and shrubs more generally planted and better taken care of, some flower-beds about every homestead, well-kept kitchen gardens, the shielding or covering of all unsightly buildings by trees or vines, better sanitation within the homes, universal bathrooms, lavatories and closets, the improvement of public buildings, school houses, school grounds, churches, manses, and glebes, by laying out artistically, planting therein trees, shrubs, flowers and vines, and providing well-kept lawns for each, also the establishment and care of parks in every municipality according to size, population and convenience, improving the architecture, approaches and general appearance of bridges, the encouragement of forestry, more particularly in the direction of planting copses of trees as a shade for farm stock, or to replace native trees that should not have been cut down. This may be more easily done on the banks of creeks, streams, lakes and rivers whose surroundings lend themselves easily to beautifying. Groves and all woods that could be easily utilized for park purposes, and all evergreens that lend beauty to the landscape and other natural features, should be as far as possible preserved. Wayside springs should be preserved and made convenient for public use. Guide boards should also be provided along the highways.

An Inviting Field.

The above are some, though not all, of the subjects included in the task of civic improvement. It is not possible, within the limits of a paper or address to discuss them at length. They are sufficiently numerous to invite the effort of all our citizens, young and old, rich and poor. To the latter they offer a specially inviting field of profit and pleasure. The poorer sections of several European and American cities have been literally transformed from apparent squalor and wretchedness to beauty and comfort by the efforts of civic improvement reformers. Productive vegetable gardens have replaced ash heaps and back-door debris, while well-kept boulevards and

lawns, flowering shrubs, vines and flowers have taken the place of bare yards and generally tumble-down surroundings.

Those Unattractive School Houses.

All who have travelled through our country districts must have noticed how unattractive are the rural school houses and their surroundings. The walls of the buildings are bare and unrelieved by a touch of green in the form of ivy, climbing roses or other vines. There are no trees or shrubs about the ground, nor are there flower-beds. The grass, if grass there be, is uncut, the fences are not always in good repair, and the outbuildings forbidding and offensive, are vulgarly exposed to the public gaze. And yet these are seats of learning! Here is where our children receive their first impressions of education. "Like produces like" it is said; if so, what must be the impressions made by surroundings so rude and repellant? There is also noted an absence of a flag-pole or flag, which every school section should have; and such flag should fly on all appropriate occasions, familiarizing the children with our national emblem, and teaching them to love and honor the dear old Union Jack, though it be "Only an old bit o' bunting!"

The Churches Also Neglected.

Then our rural church buildings are little less unattractive than are the school houses. They, too, seem to be neglected and uncared for. One might easily imagine that they were seldom, if ever, visited, so cold, bare and uninviting do they appear. If surrounded by a cemetery, as they usually are, it, too, looks neglected and ragged in the extreme. Respect for the dead if not for the living should suggest an improvement in this respect, and surely our places of public worship should be made as attractive in their exterior as are our own homes. The spirit of true worship is sacrifice, and professing Christians should show, not only by the substantial character of their churches and attractive interior, but also by pleasant and picturesque surroundings, that they are willing to sacrifice of both time and means to beautify the temples which they have erected for the worship of Almighty God.

Railway Stations and Grounds.

Another direction in which improvement may be made by vines, shrubs, flowers and well kept lawns are our railway station houses and station grounds. This is becoming more important because of the building of electric lines of railway. The same improvements should be made, and, indeed, insisted upon by the public, upon the station houses and grounds of electric railways as are necessary on steam railway properties. These improvements should be made a condition of granting franchises to companies when they apply to municipalities for them. Another condition that should be insisted upon is that all land lying alongside electric railway tracks and belonging to the companies should be kept clear of noxious weeds, and in general be well cared for. Otherwise these roads may become eye-sores to the travelling public and a menace to the crops of adjacent farmers.

Shade Trees Along Highways.

Tree-planting along the roadways would add greatly to their beauty, and if done judiciously and the trees not planted too closely, while affording a pleasant shade would not necessarily injure the roadways by holding the water, and thereby making them damp or wet.

Beautifying Rural Homes.

A strong effort should be made to induce our friends, the farmers, to pay more attention to beautifying the exterior of their homes and surrounding grounds. Farm

houses are usually located advantageously for improvements such as are suggested. An ivy, a climbing rose or any creeping vine would relieve their bare appearance, while some pretty flowering shrubs, a few evergreens, and some flower-beds would add greatly to the beauty of the surroundings. But what is still more important, they would probably inspire some members of the household to take a special interest in thus beautifying the homestead, and thereby making all more contented with the home and its environment.

Copses of Shade Trees.

Then in the older parts of Ontario and the other Eastern Provinces where the larger part of the farms have been entirely denuded of trees, when the trees of the forest were felled, some attempt should be made to partially replace them by planting, in appropriate places, copses of evergreens or shade trees. These are not only valuable as shades for the farm stock, but would greatly add to the beauty of the landscape. In the absence of hedges such as are in the old countries, and which serve the purpose of fences there, trees scattered here and there over a farm add much to its appearance.

Rural Parks.

Not only so, but every rural municipality should provide itself with one or more parks, which would become common and convenient resorts. Public gatherings, picnics, private or public, could be held there. Nor would there be any difficulty in securing suitable and attractive locations—no township is without them. In many cases they are there ready to hand with forest trees, water convenient, and the general topography all that the landscape gardener could wish; the cost of purchase would not be great, nor would the expense of properly keeping them up.

National and Provincial Parks.

In this connection it is pleasant to note that the Governments of the Dominion and of Ontario have led the way in the establishment of National and Provincial Parks. The late Hon. Thomas White, when Minister of the Interior, established a magnificent park, in the Rocky Mountains, at Banff, on the line of the Canadian Pacific Railway; the late Sir Oliver Mowat, the Queen Victoria Niagara Falls Park; and the late Hon. A. S. Hardy, the Algonquin and Rondeau Parks. There is yet room for the establishment of many more such resorts of recreation, profit and pleasure for the Canadian people.

Good Roads and Civic Reform.

The above suggested improvements are all in harmony with the general improvement of the highways of the country, which in recent years has made considerable advances, and has now reached the stage of Government and municipal control in the form of good roads improvement.

A Canadian Paradise.

With good roads to drive, wheel or walk over, with the highways tree-lined, the landscapes improved by replanting, the school and church properties which we pass beautified by well-kept lawns, shrubs and trees, vines and flowers, with a telephone in every house, an electric railway system covering every city, town and township, a rural mail delivery at every door, and an automobile, it may be, for both lighting and transportation purposes, in every homestead (for myself I prefer a good horse or spanking pair); then with the National Flag floating from a flag-pole at every school house, from Dawson to Halifax, how much more pleasant it would be to travel in the country, how much more patriotic we would feel, as Canadians, and how much more right we would have to be proud of our native land!

Urban Civic Reforms.

This paper is necessarily too brief to permit me to enlarge upon even a tithe of what is aimed at by the Canadian League for Civic Improvement in the direction of further beautifying our cities, towns and villages. All of these should have parks, picturesquely situated, wherever possible, tastefully laid out and always well kept. There should be more boulevards, more planting of trees, better kept streets, more cleanly lanes and alleys, an improved garbage system, more official attention given to regulating architecture, building of sidewalks and landscape work. Fountains should be provided as conveniences, and all local historical events should be appropriately marked by monuments or memorial tablets.

Necessary and Patriotic.

But by some it may be said that these suggested reforms are comparatively unimportant, and that the Canadian people cannot be sufficiently interested to carry them out. I deny both of these statements. They are not unimportant, for they tend to make happy homes, and they are urgently needed to meet the requirements of present conditions. Canadians are now beyond a primitive or primeval stage. They are for the most part able to do more than merely exist. They can now live and enjoy life in pleasant, if not luxurious surroundings. Being well able to afford to do so, it is nationally important that they should not neglect their opportunities and responsibilities. Their sons and daughters are better off, better clothed and better educated than were their fathers and mothers, and the more comfortable and attractive the surroundings of young people are, the more happy and contented will they be. Not only so, but they will grow to manhood and womanhood with greater affection for their parents, stronger attachment to their homes, and more fervent loyalty to their country. They will thus be happier boys and girls; more contented men and women, and, therefore, better Canadians.

A VISIT TO THE OLD WORLD.

By L. Woolverton, Grimsby.

Three months in Europe covers much more ground than I can even summarize in a brief address, and I will not weary you by much detail. In general, my impressions, after visiting Great Britain and Europe, are decidedly in favor of Ontario, either as a field for enterprise, or as a home in which to live. Those old-fashioned stone buildings, moss-covered with age and old-fashioned in style, such as you see in Oxford, in Blenheim, in Warwick or Rowsley, and, indeed, everywhere in England and on the Continent, strike me as being a hindrance to growth; they would need tearing down and carting away before a modern building could go up. And, when you add to these material obstacles the sleepy conservatism of the people, you have conditions most unfavorable to rapid progress. Nobody is in a hurry in England; if you want a cab, you do not telephone for it, but go and hunt one up; there are no electric cars in London proper, but the streets are full of old-fashioned two-horse omnibuses, with seats on top, to which you climb by a spiral staircase behind, and up there you travel slowly through crowded Oxford street, Regent street, or the Strand, and view the buildings and the masses of people at your leisure. The railway trains do not travel quickly enough, but are very awkward; the same car is divided into numerous compartments, much alike, except for the labels, 1st, 2nd and 3rd class, intended to divide the passengers according to their rank; and when once locked in, you are in prison till the guard unlocks your door again. The cars are very small, especially the freight cars, but years ago the bridges and the tunnels were made for small cars, and to enlarge the latter would mean a complete reorganization, and entail endless expense.

The wagons in England are very funny in form, and carts are much more used by farmers than with us. The latter are used entirely by the truck gardeners about Paris, who come into the city in the evening and stand in a row near the Louvre. Here the horses are fed with nose-bags, and the driver sleeps till morning on his seat, ready for the early market, with his heaps of white onions or yellow carrots, all beautifully clean. In Belgium the women take the vegetables to market in small carts drawn by dogs, who travel underneath between the wheels; while in Switzerland we saw the women everywhere making hay and drawing it to the barns with teams of cows. At Rhine Falls, near Shauffaussen, we watched a young girl of about eighteen bring out her cow, harness it up singly to the hay waggon, throw on her hay fork, jump aboard and drive off up the mountain side after her load, just like a Canadian boy. The cutting of the hay was done by the men, but the rest of the haying seemed to be largely left to the women. It was a curious method these men had of sharpening their scythes, by beating them with a hammer upon an anvil; truly the blades were made from very different stuff from those we use. Near Rhine Falls we watched the process, and certainly the man made a good job of it.

The lack of appreciation of the beautiful was very evident with this same farmer. He stopped his work to show us his Jersey cows, for which he could not find words to express his admiration, but not a word had he for the charming scenery presented by the Valley of the Rhine, and the distant snow-capped Alps. So little did he value this magnificent view that he had placed the back of his house on the brow of the hill commanding the view, without a porch or scarce a window opening that way.

But, if among the poorer classes the condition of life is inferior to ours, the rich have much to boast of. No one could sit and watch the handsome equipages of Rotten Row in London without admiring, as we did, the splendid turnouts, with liveried coachmen, magnificent horses, and elegantly attired ladies, which keep up a constant procession through Hyde Park between four and six in the afternoon. These horses and carriages are in perfect condition, and the pride of their owners. Their stables are a model of order and cleanliness for our Canadian boys who too often think it needless work to sweep a stable floor or dust a carriage before using it. We met an American tourist in London, and invited him to accompany us to see the King's stables at Windsor. Quite indignantly he replied: "I did not come all the way to England to see anybody's stables."

The great castles of England are her pride, and immensely interesting to a Canadian. We were shown through Kensington, rich with souvenirs of Queen Victoria; through Windsor, with its magnificent state apartments and royal treasures, and through Warwick Castle, with its wonderful galleries of art and precious treasures; also the ancient Haddon Hall and the elegant modern Chatsworth, at Rowsley; Edinburgh Castle and Holyrood, at Edinburg, and Stirling Castle, at Stirling; and, while we admired these great halls, rich in historic interest, we felt a sense of relief that we in Ontario have not the responsibilities attendant upon such great houses. Far from each other, and with few of equal rank at hand, these great people know nothing of the quiet, happy social life of the Canadian farmer.

Farming in Great Britain is in a retrograde condition, and many of the farmers say they are losing money every year. Rents are high and prices declining, while labor is more expensive than formerly. The fields are small, and all divided by hedges, which must entail endless expense in keeping them trimmed. Once I was an ardent advocate of hedges, and dreamed of the time when our farms would be modelled in this respect after Great Britain, but my visit to the old world has completely revolutionized my notions. Even with the cheaper labor in that country, many of the roadside hedges go neglected; what would they be in this new world, where labor is not only very expensive, but often not available at any price? Rather for us would I choose the conditions which we saw in Germany, where we rode for hundreds of miles through beautiful farms without a single dividing fence, a simple white stone here and there marking the corners.

Fruit growing in Great Britain seemed to me rather discouraging. True, the markets are good, but the cold, wet climate causes fungi and mosses to almost cover the trees; there is not enough sunshine to paint the cheeks of the outdoor grown fruit, and often the spring frosts completely destroy the crop. Having an introduction to Mr. A. J. Thomas, of Bargainhill, near Sittingbourne, in Kent, one of the principal fruit growers of that country, who has 150 acres in orchard, we were much interested in his fine old cherry trees which had been planted by his father years before. He grew all the fine old English sorts, such as we have in Ontario, but, "This year," said he, "my crop is ruined with frost, and I have not enough fruit to pay for picking."

Near Melrose, in Scotland, we visited a very old garden, planted out by the monks hundreds of years ago. The walls were about ten feet high, and covered with apricot and plum trees, trained like vines. Around the paths were the finest Cordon apple trees I ever saw; one of them in particular reaching out its arms about thirty feet in either direction, and making indeed a valuable curiosity; but, like nearly all apple trees in England, the bark was so thickly covered with moss as to threaten the very life of the tree. We asked the gardener why he did not scrape it off. "Oh," he said, "we never think of doing that; for if we did, it would only grow on again." We talked of alkaline washes and Canadian methods of cleansing the bark, but he did not believe in such rubbish. So we came to the conclusion that the conditions for successful out-of-door fruit growing in Ontario are far in advance of those existing in Great Britain.

But I must cut short what I might make a very long story. In conclusion, let me refer to the great apple markets. These we visited in London, Edinburgh and Glasgow, and were amazed at the rapidity with which fruit was knocked down to the buyers. In Covent Garden we were most kindly treated by Mr. Garcia, of the great firm of Garcia, Jacobs & Co., who placed us in an advantageous position for witnessing the auction sale of 1,500 cases of Tasmania apples. The time occupied was little more than half an hour, and yet the prices were very satisfactory. Their boxes are not nearly as attractive as those our apple growers are using; they are smaller, too, holding only about forty pounds of fruit, and the fruit itself is not packed in them so neatly, although in most cases wrapped with a thin paper. The favorite variety from Tasmania seemed to be the Sturmer Pippin, which sold wholesale at from \$2.25 to \$2.50 a box. Mr. Garcia gave us a sample to eat, and certainly the flavor was good. In size it is about equal to the average Baldwin, but not so highly colored. In our opinion it cannot be compared to our Canadian Baldwin, and if we could place our Spys and Baldwins side by side with these Tasmanians, in equally perfect condition, we would not fear the result of the sale. The highest prices for apples are realized toward the end of May, the lowest average price being \$1.75 to \$2.50 per forty-pound box, because the American apples are over and Tasmanians have scarcely begun coming in. Speaking of the best time to get the highest price, one Covent Garden salesman said bluntly: "If you are going to spend your money in cold storage, you should sneak a week where you got it yourself," and no doubt he said a truth.

Messrs. Garcia, Jacobs & Co. have handled as many as 27,000 packages of fruit in one day, so it is evident they do a large trade, especially in apples and oranges. "We paid one firm in France," said Mr. Garcia, "£5,000 in one week for consignments of plums, which will give you some idea of our business."

Taking all things into consideration, we came away rather encouraged than otherwise with the prospects before the Canadian fruit growers, and see no reason for discouragement, when we consider how favorably our fruit and our packages compare with those of the European countries.

In Edinburgh we called upon Messrs. James Lindsay & Sons, one of the largest apple houses in the city. "We buy your Ontario apples at Glasgow," said Mr. Lindsay, "and find them prime stock. Your Ontario Duchess pears, too, please us very much. We bought a lot of them last year from Thomas Russell, Glasgow, and made some money on them."

In Glasgow Mr. Russell showed us the apple salesrooms, where we found the business conducted in much the same manner as in Covent Garden. If a man's brand is reliable, he will soon become known, and his fruit will command ready sale at top prices.

Fears are in good demand in Glasgow, and our Canadian Bartletts would bring us excellent returns if we could get them carried at or near the freezing point, so that they would arrive in good condition. Since our return, we have given this market a good trial, having forwarded two carloads. The first, by the Lakonia, of the Donaldson Line, arrived in fairly good condition, and returned a net of \$2 a bushel; the second, by the Sicilian, of the Allan Line, arrived in an over-ripe and wasty condition, and brought little more than freight charges. Both carlots were packed in a perfectly green and hard condition. This shows that our ocean cold-storage for fruit is yet far from perfection.

Altogether we returned to Canada, not only refreshed in mind and body, but vastly more contented with Canadian conditions of social life, and with the outlook for Canadian horticulture than when we sailed; and we no longer wonder at the wonderful inflow of people to our fair land, for we believe there is no better country on the face of the earth.

NATURE STUDY.

By Dr. W. H. Muldrew, O.A.C., Guelph.

Very much is being said just now concerning Nature Study, Manual Training and related subjects in our schools—much that is vague and indefinite, and utterly unsatisfactory, and much that is even false and contradictory. And the fact that we are asked to discuss these questions to-night seems an indication that plain, intelligent men and women are looking for light in this darkness and confusion.

The naturalist will tell you that nature study consists in the study of animals and plants, with the aim of classifying them, and possibly recording their habits; the scientist would say that it consists in the accumulation of facts and generalizations about the world we live in; while the nature lover, the artist or the poet, will define it as the cultivation of a sympathetic attitude towards Nature. The practical man looks upon this as merely the latest fad of educational cranks, another wedge to crowd out what remains of value in our schools. And there is surely some ground for such an attitude, when we consider the number of exploded theories, each of which was once heralded as a cure for all our ills. I need only mention to teachers who are present such topics as object lessons, language lessons, temperance lessons, the word-method, the Grube method, or last, but not least, "vertical writing," to show that fine-spun theories are too often sadly disappointing in their results.

Finally, to the teacher on whom must depend very largely the success or failure of any method or system, What is implied? Very often I fear that these newer subjects must be suggestive merely of added burdens to be undertaken without adequate preparation or guidance.

Now, if we had the necessary time, it would be well worth while to consider these varied opinions at length, and to sum up the truth and error contained in them. But, just now, let us hasten on to ask for the evidence of one more witness more important than any of these, because more interested and less biased. Let us ask the child himself what he has to say in the midst of all that is being said about him. I am prepared, of course, to be told that such is the height of absurdity, and that my witness is not only ignorant as to his real needs, but is essentially perverse and wilful in his whole nature.

It is unnecessary for us here to discuss the moral question, but as regards the physical and intellectual aspects, I am free to say that the child's native tendencies are essentially right and necessary to his well-being. Without the aimless movements and babblings of early infancy, the muscles would never be prepared for walking or

for speech, and is it not true that under the guidance of such native tendencies more is learned during the first five years of life than in any later period of equal length?

Nature takes abundant pains in the education of her offspring, but with none so much as with her masterpiece—the human child. The young of the lower animals are guided by unfailing instincts, and surely man alone is not left without a witness. No one who has paid any attention to the development of a child can have failed to note his untiring interest in the world around him. The needs of men are knowledge and power, adapted to the society in which they live, and the child anticipates these needs in his insatiable desire to know his surroundings, to express himself in action, and to follow in the steps of his elders.

Thus, turning from the doctors who differ, to the child himself, we gain some idea of his real needs. From this point of view we can see the necessity for meeting the child on his own ground, and using the experiences of his daily life as a basis for all future education. Nature study aims to develop the child mind by appealing to the interests and activities of childhood. It is thus a method rather than a subject, and deals with nature as a means rather than as an end.

The most effective charge against our modern education is that it lifts the learner out of his surroundings, and seeks an artificial development quite out of relation to his experience and his interests. The schools are credited with turning the tastes of the people away from the farms and the simpler industries, while the universities are said to produce "impractical" graduates. Nature Study aims at schools in living relation with the lives and experiences of the people, in which the most successful student will be in closest touch with the needs of the real world.

Looked at in this way it is plain that Nature Study is no new thing in education. Every healthy child makes, and always has made, such the basis of his life's training. His early years are spent in ceaseless endeavor to comprehend the world around him. To this end he examines all things, tries all things, and torments his elders with pitiless questions as to the what, the why, and the how of every new experience. As a result the dullest child quickly masters a immense amount of practical information, and thus puts himself in harmony with his surroundings.

For the later loss of interest of this enquiring spirit the blame must be shared by schools and parents. The schools are to blame in so far as they have insisted that their studies must be different in kind and method from the earlier experience of their children. Parents, on the other hand, have nowadays no time to guide further this healthful development of infancy, and thus the growing boy or girl too often suffers. The interests of the home life are crowded out or lost from disuse, while nothing adequate is supplied to take their place. Learning is divorced from doing, and the common aim of both as a preparation for life is forgotten. Studies which either in themselves or in their teaching are unreal because unrelated to experience have been the bane of elementary education.

The application of this principle in our schools is plain. The vast majority of our people are, and must continue to be, engaged in agriculture or other productive industries, and this fact must be recognized in the education of the future. In training the eye to see, the hand to do, and the mind to think in childhood, the best materials must always be found in commonplace experience, and the practical interests thus fostered must continue to be those necessary to the very existence of society.

I should like to call your attention for a moment to certain other aspects of our subject. I have the word of Mr. J. L. Hughes for the statement that horticulturists are one of the most moral classes of people in the world, and that gardeners are very rarely connected with any crime. This is no doubt due largely to the nature of their occupation, and to the fact that they see the relation between cause and effect, between conduct and its rewards, in such a concrete form that they cannot forget it. Can we doubt that surroundings which affect thus the full-grown man will be much more powerful in their influence on the growing child? A man's life is more than his possessions, and the thoughts that fill his mind are more than the fruits that hang on his trees. The

emotional side of man's nature depends very largely on the experience of his childhood. He who has never been a child and who does not continue to be a child until he is old misses much of this life. The man who in his childhood has lost communion with nature must have all through life a terrible blank in his mind, where he might have had something of constant value and influence as long as he might live.

Such principles are not opposed to the highest ideals of a truly liberal education. All experience goes to show that a mind trained to interpret the commonplace truths of nature gains in this way a mastery over facts and methods of thought that will prove of equal value on the farm or in the university. It has been well said that the education of the past has filtered down to the people from the universities, whose ideals were inherited from Greece and Rome. The education of the future will rise up from the people, based on the needs of life here and now, and will thus gain a vitality impossible to artificial systems.

To further such aims is the purpose of the Macdonald Institute at Guelph, which I have the honor to represent here. This institution has been built and equipped by Sir William Macdonald as a college for the preparation of teachers fitted to apply in detail the methods here broadly stated. In addition to this, however, there are provided thorough courses in practical household science, which are intended to be to our young women what the O. A. C. has already become to our farmers' sons. In such ways we hope to exert a healthy influence on the schools and the people by showing the unity of Education and Life.

CO-OPERATIVE FRUIT PACKING AND MARKETING

By W. H. Owen, Catawba Island, Ohio.

When the stockholders of an industry are meeting with successful results in the disposal of their products, little thought or attention is given to competitors along the same line, until competition, over-production or under-consumption depreciates the value of their products to little more than the actual cost price of same; they then give their attention to methods that will better their conditions, and devise ways and means by which they may reduce the cost price and competition.

How is this change for the betterment of their conditions usually brought about? Invariably through the same channel, by organization, by trusts, and by co-operative associations. What is true of the manufacturer in this direction is also true with the farmer and horticulturist, in the disposal of their products.

The Californians were probably the first to co-operate in marketing their vast product of fruit, which was really the result of necessity, for their industry rapidly expanded, until their local markets could not consume the enormous production, and they were obliged to seek other and more distant markets. This they found could not be accomplished individually, but through powerful corporations they have succeeded in gaining low rates and improved methods in handling and shipping. How well they have succeeded we are all familiar, and now we find their fruits in nearly every market of the country—even competing with our own products in our local markets. Organizations, judiciously managed, have placed the Californians in the lead in the way of distributing and marketing their fruits. Through their efforts, is due the credit of perfecting the present refrigerator service, by which they are enabled to ship their more perishable fruits, even to the great markets on the Atlantic seaboard.

Missouri is fast accepting the profitable teachings and examples of the Californians, and her vast fruit products are now largely handled through companies and shipping associations.

Michigan, having the greatest market in the world at her very doors, had no occasion to look elsewhere than Chicago or Milwaukee for her markets. However, the Wolverines have discovered in recent years that the enormous contributions of fruit from Missouri, Southern Illinois and Indiana to these markets, has in a measure forced

them to look elsewhere for a portion of their markets. They now ship hundreds of carloads of peaches annually to Eastern markets and the Western and North-western States. This was not brought about, however, until co-operation among the growers in different localities was instituted.

The extreme Eastern peach-growing States—New Jersey, Maryland, Delaware, Pennsylvania, and New York—are so favorably located in reference to so many large consuming markets that organization to them has not been so paramount to their success as it is to the Middle and Western States.

The further from market the greater need of getting together, as the risk increases with the distance.

I will confine my discussion principally to the advantages in organization for handling one of the most perishable of the tree fruits, viz., peaches.

Peach-shipping associations have been operated with more or less success throughout the peach belt of Michigan and Ohio, but in shipping in carload lots, although complying with rigid rules laid down by the Association, there was an objectionable feature to the trade, and that was the lack of uniformity of grades and packing. To be more explicit on this point, you have all probably visited some of the various markets during the peach season, and have noticed the very great difference prevailing in grades of different packs. That is, some packers' B or XX grades were just as good as some other packers' A or XXX grade. Therefore, the grade marks of the general run of consigned fruit, where not put up by one set of hands, as a rule, are not of very great assistance to the purchaser, and he still is obliged to resort to his own judgment and eye-sight in his selections. Now, for a shipper to make up a carload of this indiscriminate packing of fruit, where it is packed by many growers, each contributor having a different way and idea of how peaches should be packed and the kind of packages used—conceding that they are all honestly packed—how is the shipper going to bill that indiscriminate lot of fruit, and can he warrant the packing? This serious objection of lack of uniformity confronted the Michigan fruit growers, and has resulted in the adoption of the central packing house system by their principal associations. This system was originated and established in the peach industry at Catawba Island, Ohio, in 1891, and it has resulted in untold savings and benefits to the peach grower wherever the system has been adopted.

The mere shipping association, where each grower prepares his own fruit and delivers it to the association, by which it is shipped with other packs and packages, either in carload lots or local shipments, is a step in advance over the old or individual method of shipment; but the central packing house system is a much greater step in advance over the mere shipping association.

The old adage of, "In union there is strength," is most aptly exemplified through the many advantages that may be attained through an organization of fruit growers, organized for the purpose of bettering their conditions in shipping and marketing their fruit. The many discouraging problems that confront the grower in the satisfactory marketing of his product, I believe, are satisfactorily solved through the adoption of the central packing house system. At least, such has been my observation through the management of such a company for the past twelve years.

Let us for a moment review further a few of the advantages to be attained through such an organization. First, the grower can place his undivided attention to the proper picking of his fruit, which is a very important factor; whereas, it is known, that if peaches are picked green or immature, or over-ripe, and delivered to the packing house in such condition, no amount of work that may be put upon it can make good prime fruit of it. The great advantage of the central packing house is the superior advantages and inducements it offers to purchasers of fruit in securing a uniform grade and pack. It affords a place where the buyer can select just the grade and kind of fruit that best suits his trade. When the fact is known to the trade that they can procure their supply direct and in any quantity desired, and every package guaranteed to contain freshly-picked and uniformly-packed fruit, even the commission men will then come to your doors and

buy. Buyers are looking for carloads of uniform fruit, and not for carloads that are not uniform.

This system entirely eliminates the practice of deceptive packing, and gives buyers confidence that they are getting honestly packed fruit. Even were you obliged to consign largely, it will bring better prices on the market, and the commission firms are bound to take better care of your interests than of the individual shippers; because there is more at stake, and the merchant realizes that if he makes a mistake or misleads you in his advices, he will probably not have the opportunity of handling your account again. The labor saved at both ends, by dealing with one man or corporation instead of ten or fifty, becomes apparent, and the commission man can afford to handle a corporation account on a less percentage, and it really pays him better because of work and time saved. And again, buyers, after becoming acquainted with your grades, pack and manner of doing business, can order their supply of fruit intelligently and without the necessity of retaining a representative at the shipping point.

Another great and beneficial effect of such an organization is through its influence in broadening the field of distribution; it does to that extent disprove the "over-production" policy.

We have found that in our own dealings with transportation companies, basket manufacturers, and even the commission men, they lend a more willing ear, and correct errors and abuses with greater promptitude when presented by the authorized representative of a company than they will do for any individual or small grower presenting a case possessing equally as much merit.

Transportation companies consider a well-organized fruit company, working upon sound business principles, in the same light as any other well-established business, which contributes to their receipts.

We as a company have found them disposed to grant favors and investigate complaints fairly, while the lone individual, under the old plan of "every fellow for himself," would perhaps have remained unnoticed.

Lastly, a recommendation that is appreciated by those that have had the experience in the central packing house system, is the fact that it relieves the home and good housewife of that burden which is attendant through the care of the extra help that will now be dispensed with.

Now as to the expense of organization under this system. Some may raise the objection that it will cost too much to establish a plant, but you will find after careful investigation it will be far cheaper for each to contribute toward a general plant than for each individual to supply himself with a packing house, a grader, and other necessary equipments. In the establishment of a central packing house, make sure of one point, and that is, provide a building with ample room for receiving, grading and expeditious handling of the fruit. If the requisite amount of floor space is not provided, it will necessitate vexatious waiting of the members in taking their turn at unloading their fruit.

Do not think that a room with no more space than would ordinarily be used by three or four of the larger growers of the company and equipped with insufficient number of graders will properly take care of the fruit of twenty or thirty orchards, for it will not, and such conditions will only result in loss, through failure in being able to get the fruit through promptly.

As for laying down defined rules for organizing, that is a matter which each locality will best work out for itself, as local requirements and conditions vary.

Now, what is wrong with the present system, or more properly, lack of system, outside of the already established organizations? Can you name any industry wherein so many hundreds of thousands of dollars are invested, that is conducted so carelessly as the fruit business of this great fruit-producing country? It is a great wonder to me that the average peach grower should even get the price of his packages in return for his labor. To make it plain, the average orchardist cannot afford himself the facilities for keeping in touch with the trade, and keep posted daily on the changing condi-

tions of the various markets. He is too busy harvesting his crop to study out the best plans and inform himself of the best places to ship, in which he will meet the least competition. And right here I wish to emphasize that word "competition," for are we not each and every one of us placing our fruit in direct competition with each other? Again, the orchardist individually is placed at disadvantage through his inability to properly distribute his fruit. I say inability, because he has no control over other shipments, and has no means of knowing but that 90 per cent. of the other shippers throughout his vicinity are shipping to the very market in which he expects to avoid a glut.

There is surely a way out of this dilemma, and a practical and time-tried way, that I am confident, if universally adopted, would place the product of the orchard on a far more profitable basis than is now being realized. As long as the present careless methods are continued, we may expect to be the victims of our own failure to protect our interests by the positive means within our reach.

If we will carefully investigate the hundreds of unions and co-operative plans that are now in existence in nearly every branch of business, you will find they are all declaring handsome dividends to their stockholders, while prior to their consolidation, in many cases they were actually running at a loss.

What has been true in other branches of business through result of co-operation to avoid competition, and reduce the cost of placing their products on the markets, can be made true of the fruit industry in the different fruit growing sections of the country. It is not a visionary and undemonstrative theory. It is the furtherance of a co-operative plan that is now in actual, practical and successful operation in several of the States; and the more universal this system may become adopted, in like proportion, better results will follow.

If some of the fruit organizations have not proven entirely satisfactory to their members, due to mismanagement, that should not prejudice or deter those interested from investigation of the plan; for there are fruit companies that are thoroughly successful and making money for their members. The co-operative fruit company will succeed if organized and managed upon a business basis, just the same as any other business enterprise requiring co-operation. It is surely the best means in which to conserve the interests of the producer, and we know that the grower's interests can be best served through facilities which they may own and control.

After thorough local organization has been effected throughout the various fruit-producing sections, let us for a moment see what further advantages might be attained in the way of uniting all these companies in each county or section into one powerful corporation.

County consolidation could be successfully accomplished only through the central packing-house system, and then not until local organizations had been established and perfected at the shipping points throughout the county. After the establishment of companies at the different shipping points, then the consolidation of all, into one powerful union under one management, would place the fruit-growers in possession of the key to the situation of the avoidance of market gluts, competition and distribution. To accomplish such an end of thorough organization it would mean for each locality to enter the work with a spirit of determination. We must be prepared to join our neighbors in correcting the existing wrongs and surmounting the obstacles and objections that may confront us. We have the power, and we can do it if we see fit. As one of our western horticulturist very aptly stated: "If I were compelled to use but one word in designating the remedy for the many evils and disadvantages with which we have to contend, it would be 'organization.'"

Organization leads to co-operation, and organized co-operative effort is the power and influence that is shaping and moulding the financial and commercial interests of the present time. Look where we will at any business worthy of the name, and we find it compactly united in some form of union that seeks to make the interests of one, the care of all and the prosperity of all the prime object of each individual.

CONSTITUTION AND BY-LAWS

Of the Island and Gypsum Fruit Company, incorporated under the laws of Ohio. Capital stock \$5,000. Act amended June 13, 1900.

CONSTITUTION.

Section 1. This association of fruit growers, being incorporated under the laws of Ohio, shall be known as the Island and Gypsum Fruit Company. Its capital stock being in the sum of \$5,000.

Section 2. The object of its organization is for the sale of the fruits grown by its members, also to buy and sell such fruits during the season as opportunity presents.

Section 3. The annual meeting of the stockholders of this company shall be on the first Saturday in December of each year. Special meetings of the stockholders may be held at any time upon call of the President, by written notice mailed to each stockholder of record.

Section 4. At the annual meeting of the stockholders five Directors shall be elected.

Section 5. At any meeting of the stockholders a two-thirds representation of the stock, either in person or by written proxy, shall constitute a quorum for the transaction of business.

Section 6. The officers of the company shall consist of a President, Vice-President, Secretary and Treasurer.

Section 7. Immediately after the annual meeting of the stockholders and the Directors are elected, it shall be the duty of the Directors to elect the officers as named in Section 6.

Section 8. All elections of this company shall be by ballot, plurality electing, conducted by two tellers, appointed by the President.

Section 9. The President, or, in his absence, the Vice-President, shall preside at all meetings of the stockholders. In the absence of both, a presiding officer shall be chosen by the stockholders.

Section 10. The Secretary shall keep a record of the proceedings of all the meetings of stockholders and directors, and shall receive as remuneration the sum of \$. for each and every meeting, when such services shall be duly rendered by said Secretary.

Section 11. The Treasurer shall keep a correct record of all the receipts and disbursements and report the condition of the finances annually, or as often as the Directors shall desire.

Section 12. The Directors may select not to exceed three of their number to act as an Executive Committee (the President to serve as Chairman of this Executive Committee), to have general charge of the affairs of the corporation during the fruit season. This committee shall order all purchases of supplies. The Directors shall regulate the amount of compensation this committee shall receive.

Section 13. Any fruit grower in Ottawa County, this State, shall be eligible to become a member by a two-thirds vote of the stockholders of record at the time the application is made, also a two-thirds vote of members shall determine the value of each share of the stock that such party shall pay into the treasury, if he or she shall be admitted as a member.

Section 14. The Constitution or By-laws may be amended at any regular or special meeting upon a vote of two-thirds of the stockholders or stock in the affirmative.

BY-LAWS.

Article 1. The Board of Directors, during any season when there is not a failure of fruit, shall meet in session semi-monthly, beginning such meetings not later than July 15th of each year.

Article 2. The Executive Committee, during the fruit season of each year, shall meet at least once a week, or oftener if the interests of the company shall demand.

Article 3. The President shall have a general supervision of the business of the company.

Article 4. On or before the first of May of each year, when the fruit crop is not a failure, the Directors shall meet and name their Manager for the season.

Article 5. The Manager shall have charge of the business of the company in its detail, under the supervision of the President.

Article 6. The Manager and Treasurer shall give bonds in such sum as shall be acceptable to the Directors.

Article 7. The Treasurer shall receive all moneys from the Manager and deposit the same in such bank to the credit of this company. Such depository of the funds to be designated by the Directors. The Treasurer shall check the same upon order from the President, countersigned by the Manager, or upon order from Manager, as may be directed by the Directors.

Article 8. It shall be the duty of all officers to attend all regular or special meetings of the company, and to hold office until their successors shall have been elected.

Article 9. When a vacancy shall happen, either by death or resignation, in any of the offices established by the constitution or by-laws of the company, it shall be filled at the next regular or special meeting.

Article 10. At the annual meeting of the stockholders, each year, the Manager shall render a statement of the business for the season in full.

Article 11. Any member of this company may withdraw at any time, between December or the first day of April. Such notice of withdrawal must be given in writing to the President or any Director of this company. Thereafter it shall be the privilege of such retiring member to sell and dispose of his or her fruits as they shall elect, but this company shall not take or handle any of such member's fruit thereafter, during that season, unless it shall be determined by a two-thirds vote of all members in the affirmative.

Article 12. In consideration of the several assessments which have been placed upon the present stock of record, previous to 1900, to each and every member holding such stock there shall be issued (gratis) another share (\$50.00) for every share so held.

Every member shipping not more than 5,000 bushels of fruit shall hold two shares (\$100.00) of the capital stock, and shall take out additional stock for increased output, as follows:—

- 1 share for all over 3,000 bushels up to 5,500.
- 1 share for all over 5,500 bushels up to 8,500.
- 1 share for all over 8,500 bushels up to 12,000.
- 1 share for all over 12,000 bushels up to 16,000.
- 1 share for all over 16,000 bushels up to 20,500.
- 1 share for all over 20,500 bushels up to 25,500.
- 1 share for all over 25,500 bushels up to 31,000.

Article 13. The stock shall pay a dividend of 7 per centum, less incidental expenses, as repairs, insurance on buildings and taxes. This 7 per centum shall be collected from each member's fruit account in proportion to the number of bushels of fruit with which each has been credited.

Article 14. Dividends on stock, as provided for in preceding article, shall not apply in time of a failure of fruit crop. In such times dividends shall be void.

Article 15. No transfer of stock shall be lawful unless duly recorded upon the books of the company.

Article 16. All peaches, pears, plums and quinces grown by each and every member of this company shall be delivered to the company's packing house for grading, packing and shipment.

Grapes and other small fruits may be delivered to the company for sale or disposal, and shall be disposed of for the grower on commission of one cent per basket.

Article 17. Each and every member shall pick his fruit in prime condition and deliver same promptly to the company's packing house. In case green and immature fruit or overripe fruit, or windfalls, be delivered by any member, same may be accepted and said members shall be credited with average price such fruit may bring.

Article 18. Each and every member shall have the right to give away such fruit of his own raising as he or she may elect; but shall not seek, solicit or make sale of fruit outside of the company, excepting windfalls and cull grades of any fruit that may not be accepted by the company. Any member so doing shall pay into the company's treasury the sum of fifty cents per bushel for all such fruits sold, excepting sales of afore-said grades.

Article 19. All fruit delivered each day shall be credited to the person furnishing the same at the average price which fruit brought that day.

One-third of the amount so credited may be retained by the company until the close of the season for final settlement, and from the aggregate of the amount so retained from each person there shall be, at the end of the season, before paying the same over

to the respective members of the company, deducted all expenses and losses. All expenses of handling, packing and marketing fruit shall be borne by the several members of the company, in proportion to the number of bushels of fruit with which each has been credited. All losses and rebates shall be deducted in proportion to the money credit of each member.

Article 20. Whenever, in the opinion of the Directors it is impossible for the company to receive at its fruit house all the peaches grown by its members, they may permit individual members to grade and pack the same for shipment through the house, such period to be limited by the directors. Reasonable compensation will be allowed for such grading and packing.

Article 21. Permanent or temporary additions, extensions or any new buildings from time to time that may be constructed by the company, including the present ice house, the cost of same shall be paid by the stock of issue by a fund sufficient to meet such costs by an assessment upon the said stock as it shall appear against each and every member, and not as an item of general expense.

Article 22. The cost of ice and the cost of putting the same into the ice house as it now stands, and each and every season when the said ice house shall be filled, shall go into the general expense and paid for as named in Article 19 to the By-laws.

Article 23. Before the annual meeting, as named in Section 3 of the Constitution, if there shall be available funds in the treasury after all debts shall have been paid, the Board of Directors then, if in their opinion it shall be deemed best, can order a cash dividend to be declared and paid to each stockholder of record up to the first day of December of each year.

No.

Date

THE ISLAND & GYPSUM FRUIT CO.

Received from

Bushels Peaches, ungraded.

Other Fruits

Receiving Clerk.

PEACHES GRADED.

GRADE	CARRIERS	1	1-2	1-4	TOTAL IN BUSHELS	PRICE	AMOUNT
AA							
A							
B							
C							
TOTAL OF PEACHES							
Culls							
Other Fruit							

Grader No.

TOTAL CREDIT, \$

H. W. Dawson : Mr. Owen's paper is quite in accord with my own views on the subject. I have always maintained that co-operation and a central packing house would be a great benefit to the fruit growers. The most successful fruit and produce shippers on this continent are those that have adopted this principle, and where they also have distributing agents to look after the distribution of their goods, so that they do not glut one particular market ; or, if a glut must come, as will be sometimes the case, they then arrange that it shall come in the one market only. It is not always possible to prevent a glut, but co-operation makes its prevention easier by having an agent or agents watching the different markets and directing the supplies to the markets that will give the best returns. By adopting the central packing house, you are certain to get a uniform grade. I would sooner be a buyer than a commission merchant if I could get grade and quality. It is then always a pleasure to handle the goods, and is easier to get good prices for them. The shippers of Texas and Florida have adopted this method with great success. When you get a package of their goods marked with a certain grade, you are certain that the goods will be up to that grade, and we can buy by telegraph with all confidence. A man cannot get a car load of uniform peaches in Canada to-day ; we are often asked for them, but find that we cannot quote them, and we have to sell the goods of individual shippers on the merits of that shipment alone. Speaking as a commission man, I would sooner handle the product of such an association at a less percentage than I would individual shipments at a higher percentage.

President Bunting : Mr. Owen did not tell us anything about the method of operation, or how they go about forming such associations.

Q. : What is the usual size of packing houses, and the usual number of graders.

Mr. Owen : It would depend entirely on the amount of fruit you expected to put through. We have a membership of 34 in our association and an acreage of over 1,000 acres of fruit. We have 155,000 peach trees, beside pears, plums, quinces and grapes. Our packing house is 55 x 100 feet ; that is the main building. It is a two-story building. In the rear we have the basket house, about 30 x 40 feet, where we put our baskets, besides storing them on second floor of main building.

We experimented considerably in the building of a packing house, and believe we have arrived at the proper way of constructing it so as to handle the fruit expeditiously. The building is located on the railroad track, and on the opposite side, where the fruit is delivered, along the length of the building is a raised platform, and the road is graded up to it so that top of wagon is on a level with floor. The platform is three feet higher than the floor of the building, and is about 25 feet wide. This is for the receiving of fruit. When a grower drives up and delivers his fruit, he is given a receipt for the number of baskets delivered. His fruit is then ticketed and run through the graders separately. In a house of that kind we usually run about seven graders, the capacity of which is one hundred bushels per hour or a thousand bushels in ten hours. When we give the grower his receipt, we retain a duplicate with a stub attached with the different grades and the different sized packages we use. Whatever package his fruit is run into we give him credit for that, and he is given credit for his fruit also according to grade. At the close of the day we pool our sales of the different grades for the day. In case we consign any of the fruit, we hold the average open until we get the returns and then give the member his proper credit, so that each one has a credit for all he puts through. There is no pooling of the whole fruit. If a man grows better fruit than his neighbor, he gets credit for it. We have to consign very little fruit. We find that the commission man will come to us and buy, as he knows he can get what he wants from us. We can supply a car of any given grade of fruit. We have a demand for the cull grades, as well as for the better grades. They will come and buy of us and pay to the extent of twenty cents per bushel more than they will give the individual grower. The expense of operating is pro-rated at the close of the season among the growers in accordance with what each one has contributed. In our case it ranges from seventeen to nineteen cents per bushel. That covers the whole expense, including packages, netting, telegraphing, telephoning (which sometimes amounts to \$100 per month) and post-

age, which is quite an item, because we send out price lists every week to the trade, quoting prices for the coming week and stating what we shall have to offer. Then there are other incidental expenses, such as stationery, printing, the manager's salary, and wages for packing, grading and shipping. All this is combined in that 17 to 19 cents per bushel. The larger the output the less the proportionate expense.

In the matter of baskets, we can go to the basket manufacturer and buy our baskets by the carload, and, as we take a great quantity, we can get them much cheaper than the individual would get them. If we have any complaint to make to the railroad company it is properly and promptly considered, and we have very little difficulty in getting claims through if there is any justice in them at all.

You were speaking of the way of shipping here in Canada, and I was very much surprised at this resorting entirely to express shipments. We use express very little,—only in the early part of the season and for nearby markets; but we have very moderate rates even then. If you people would come to the idea of using refrigerator cars and get a good refrigerator service you would bring your express companies to terms quicker than in any other way, as you would have an alternate means of shipping and not be dependent upon them.

In the matter of transportation in refrigerators, we load our own cars. They are iced previously by the railway company. We see that they are in proper condition when they leave the packing house. In that way we can ship to all the markets of the country. Our greatest markets are the eastern markets—New York State, Pennsylvania and the eastern seaboard. We pay considerable attention to the smaller shipments to the retail grocery dealers throughout the States of Ohio and Pennsylvania, and also west into Indiana. We handle this trade very successfully, and growers will pay a better price for our goods, getting the fruit fresh, than they will to a commission man or jobber. In fact, we are doing the same business that the commission man is doing, but we are always on friendly terms with him, as we sell largely in carload lots to the jobber and commission man.

Q. Do you have a cooling house?

Mr. Owen: No; it is not practicable in handling peaches, to put them in cold storage, except putting them in the refrigerator cars and getting them to market as soon as we can. We aim at getting everything out the same day, but sometimes we have to work all night to accomplish it. Then we have a day and a night crew. In that way we clean up the floor ready for the next day. As a rule the farmer will pick his fruit and along towards evening will commence coming in, and when they are bringing in from three to five thousand bushels a day and the greater part of it in the latter part of the afternoon, we cannot get it disposed of till towards the following morning.

Q. How many hands will it take to do that?

Mr. Owen: In handling three thousand bushels a day it will take about 30 hands in the different departments.

Q. As to shipping by refrigerator in preference to express; can you ship in small lots to the retail trade by refrigerator?

Mr. Owen: Yes; we can ship a 100-bushel lot, which is our minimum, to move less than a car lot. In almost every small town there is a dealer who will take a 100-bushel car. If it is a smaller amount, it usually goes by express.

Q. What is the maximum distance of your growers from the packing house?

Mr. Owen: Some haul for a distance of seven and a half miles.

Q. In what condition does the fruit reach you for re-packing?

Mr. Owen: In very good condition. I wish to refer to our by-laws. In an organization of farmers you must have very binding by-laws to hold them together. We stipulate in our by-laws that the fruit shall be picked in prime condition and delivered promptly. If it is green or over-ripe, or windfalls, or in any way objectionable, it goes into a pool by itself, and the grower will get the credit of it.

Q. Does the manager decide as to this?

Mr. Owen : It is left to his discretion as a rule. The manager has entire charge of the whole system ; and, of course, he is backed up by the Board of Directors. They are at his call at any time. Speaking of the condition the fruit arrives in, we oblige the grower to pick his fruit in firm condition and of good color, and to bring it in spring wagons. They bring anywhere from 10 bushels to 125 bushels to a load, and the fruit is usually delivered in bushel baskets.

Q. Have you an Act of Incorporation ?

Mr. Owen : Yes, under the laws of the State of Ohio.

Q. Do the growers take any special means in packing to insure safe delivery ?

Mr. Owen : No ; they do not do any packing. All they have to do is to pick the fruit and put it in bushel baskets and deliver it. We then run it through the graders and pack and ship it.

Q. Can you tell us about what express rate you pay for 100 miles ?

Mr. Owen : To a competing point where there are several railways or several express companies we usually have a better rate than to an exclusive point. I can recall one place of probably a little more than 100 miles distance where we have a fifty-cent rate per hundred. They will take ten of our peck baskets, weighing twelve and a half pounds a piece for 100 pounds, which is very liberal, or they will take two bushels or four halves for 100 pounds.

We allow our members to withdraw any time between December and 1st of April. During the rest of the season they are obliged to remain in the company. Any member who sells fruit outside is fined fifty cents per bushel, so as to prevent members competing with their company.

Q. Does the system cover apples ?

Mr. Owen : No, but I do not see why it should not operate in the apple industry, except that, as I understand it, you pack most of the apples in your orchards, but under severe inspection, which you might establish, I see no reason why you should not handle the apple business in the same way and at less expense.

A. E. Sherrington, Walkerton : I am very glad to have heard this paper, as I believe it will entirely change the system of packing apples in this country. It will answer just as well for the packing of apples as for peaches, and perhaps better. The apples can be placed in a barrel in the orchard just tight enough to convey them successfully to the central packing house for repacking, and the brand placed upon them there. We are working co-operatively in our section ; we have between fifty and sixty members, and turn out between three and four thousand barrels of apples, but each member packs and grades his own fruit. In that way we get a diversified grade, and we have difference of opinion as to what grade the fruit should take, and also different qualities of apples in our orchards, which gives some difficulty. A central packing house would overcome that. I have been thinking along these lines myself, and am perfectly satisfied that we could so reorganize our Association that we should be able to run a central packing house. The people in our vicinity at the present time are just waiting to see how we close this season's business. If it is successful, as it will be, they will be ready to unite with us. The only fear I have is that it will grow beyond our management. There is a great advantage in co-operative work, especially in regard to handling apples. Large quantities of apples are grown in our district, but under the old system, where the fruit was bought in the orchard by the buyers, it was picked and often left on the ground for weeks, where it deteriorated to a very great extent. This difficulty would be overcome. This year we found that through co-operation we had no apples going to waste upon our hands, but were able to place them all upon the market, and realize something for them, thus utilizing varieties that in other years had been allowed to go to waste.

Wm. Rickard, M.P.P. : There are unquestionably great advantages to be gained from the co-operative packing of apples. But what strikes me is this, can we satisfy all the growers by having them bring their fruit to a central packing house to be packed and graded ? If all had good orchards and lots of good fruit, it would not be so dif-

fault. As it is, one man's apples would be worth much more than another man's, and that might lead to dissatisfaction.

Mr. Sherrington: There might be some difficulty in this respect for the first year or two, but I don't think there would be after that. If we could put our apple-growing industry on a more paying basis, the men who now grow poor quality would become interested in their orchards and soon produce a better quality. There is no doubt that, at the present time, we have growers who are producing a better quality of fruit than their neighbors, but there will be a number of those in a district who are growing number one apples. Their fruit will grade pretty nearly alike, and will be shipped alike as a certain grade. The men who are growing poorer fruit will have it graded as No. 2, and it will be sold together.

Q. But they may not think as you do about it, and will not be satisfied!

Mr. Sherrington: But we shall have by-laws, and if they will not abide by them they must step down and out.

W. A. MacKinnon: This brings us to consider a very important phase of the subject, and that is the limits of co-operation. Is there any reason why the movement should end with the shipment of the fruit? Why should not an association of this kind instruct the grower in the cultivation, pruning and spraying of his trees, and so reduce to a minimum the poorer grades of fruit? We have had during the past few years a great deal of correspondence in reference to the second grade of apples under the Fruit Marks Act. The second grade is not defined, and there is a demand for a definition. I think this Association should have a voice in deciding what a second grade apple is. If you are silent, others will probably get their way. I think this is a subject for a committee, and that one should be appointed to consider this definition.

G. C. Caston: This will be a very difficult matter to settle. It will be a comparatively easy matter to settle a No. 2 grade in some classes of apples, but it is very difficult in such varieties as the Fameuse, Northern Spy, Baldwin, etc., which vary very much in different sections of the country. But I agree that it ought to be done, as people all over the country are asking what a No. 2 apple is.

At the request of the meeting, the President named the following as a committee to consider the definition of a No. 2 grade, and to make a recommendation upon the subject: Messrs. E. D. Smith, Elmer Lick, A. McNeill, W. H. Dempsey, A. E. Sherrington.

REPORT OF THE TRANSPORTATION COMMITTEE.

By G. C. Caston, Craighurst.

The transportation question is one of the most important that we as fruit growers have to consider. The industry is constantly growing. This Association has done most valuable work in the past, and its energies could not be directed to any question in the future that would benefit the fruit growers more than a satisfactory solution of the transportation problem. As you are aware, a committee was appointed last year to take up this matter and to wait upon the transportation companies, and upon the Dominion Government, along with delegates from other Associations, with a view of securing the appointment of a commission to investigate this whole question. Your committee did its share, I think, in bringing influence to bear upon the Government and in presenting the grievances of their fruit growers in such a way as resulted in our receiving a promise that such a commission would be appointed. When that commission is appointed the next step will be for us to make as strong a presentation of our case as possible. It is of no use going before the commission unless we have a strong case. You will have noticed that within the past few weeks the Manufacturers' Association has appointed a railway expert to represent them before the Traffic Association. It has occurred to me that perhaps we might secure a share of this man's assistance.

I think we might also obtain the co-operation of the local fruit growers' associations, some of which are doing good work in this direction.

At a meeting of fruit growers representing the Ontario Fruit Growers' Association, and the Niagara District United Fruit Growers' Association, held at St. Catharines on the sixth day of June, the following resolution was presented and unanimously endorsed by all present.

Moved by S. M. Culp, Beamsville, and seconded by James Titterton, St. Catharines, and resolved: "That it is the opinion of this joint meeting of representative Fruit Growers of the Ontario Fruit Growers' Association and the Niagara District United Fruit Growers' Association, that, in view of the probable heavy output of fruits during the coming season, the time is opportune for a considerable reduction in the rates of carriage that are now charged by the express companies of this country; that, in fact, if a reduction be not made, the shippers of this district will be forced to make more extensive arrangements, whereby the large proportion of their shipments will be sent forward by the freight department under refrigeration, a system which in the past few years has proved very satisfactory. It is considered by this committee that a reduction of at least 25 per cent. on present rates should be made to equalize the express rates with those prevailing by freight. This would mean a rate of 10c per eleven-quart basket on shipments to Ottawa and Montreal, as against a rate of 5½c by freight.

"It is submitted that a charge of 13½ cents per basket on fruit selling around 25 cents and upwards per basket in Montreal is out of all proportion, and if not reduced will result in a large amount of traffic being diverted to other channels, or in the fruit being left to rot in the orchards of the country.

"It is also suggested that in case the express companies comply with the request of the meeting that there is no doubt that conditions will be such as to necessitate preparations being made for a largely increased business during the season of 1903."

The question of a proper refrigerator car service is closely connected with that of transportation. Most of you know how the California fruit is handled. The growers there can get whole trains made up which travel at express time through the country and land shipments in distant countries in good condition.

The following is a letter I have received from G. B. Robbins, with reference to the refrigerator car service in California:

Chicago, May 2, 1903.

G. C. Creelman, Secretary, Toronto, Ont.:

Dear Sir,—As you may be aware, we are large owners of combination ventilator-refrigerator cars, and handle a large portion of the shipments of fresh fruits, berries, etc., of this country shipped under refrigeration.

Our plan of operation is to furnish suitable cars and attend to the initial icing and reicing of same en route, for which refrigeration service we charge a reasonable profit, in addition to the cost of the ice.

We also furnish to some extent cars for shipments of apples and other fruits, etc., under ventilation, but not requiring refrigeration, or, in cold weather, for shipments requiring protection from frost, our cars being built to withstand an outside temperature of zero or a little below. Such shipments under ventilation or for frost protection, however, we only furnish equipment for in case the runs are of sufficient length or the service active enough that the cars will make good earnings for mileage, or upon payment of some bonus by shippers for the use of the cars.

We handle practically all of the summer green fruit from California and most of their oranges, as well as all the Florida berry, vegetable, orange and pineapple shipments, and practically all of the strawberry business from the Atlantic Coast Line, Delaware, Tennessee, Missouri, Arkansas, etc.

We understand you are most familiar with the business of this character originating in Ontario, and if there is a demand for a service such as above outlined, we will thank you very much to give us some particulars in regard thereto, including volume and nature of shipments under refrigeration, territory in which they originate and move to, and time of movement, and same information with respect to ventilated shipments or those requiring frost-proof equipment.

Yours truly,

Fruit Growers' Express,

By G. B. Robbins.

Chicago, May 28, 1903.

Mr. W. H. Bunting, President Ontario Fruit Growers' Association, St. Catharines, Ont.:

Dear Sir,—Yours of May 25th. Without more definite information, we do not see how we can go into the subject more definitely than explained in our letter of May 2nd, except, perhaps, to say that our charge for any highly perishable shipments under re-

frigeration would be from \$15 to \$20 per car, in addition to the cost of the ice, and our cars take more ice than most railroad refrigerators. It is therefore plain that our service would be desirable only in case the service in the railroad cars has proven inadequate or unsatisfactory, as in the case of shipments from most warm districts in this country. Possibly we may not make much headway in the matter until we are able to send a representative to personally canvass the situation, which we may not be able to do until next winter, as our men are very busily employed in other shipping sections until that time.

Yours truly,

Fruit Growers Express,
By G. B. R.

President Bunting : It has struck me very frequently in connection with this question that we as growers speak in a general way of the difficulties under which we labor, but when it comes to getting down to actual facts and endeavoring to bring something tangible, something that will carry weight, before the people with whom we have to deal, I have found great difficulty in securing assistance and co-operation from my brother fruit-growers. We either have a grievance in connection with this matter or we have not. If we are suffering under a disability, it seems to me that it is the bounden duty, not only of those officially appointed, but of every member of our Association, to do all he possibly can to strengthen the hands of those who are endeavoring to secure relief. During the past two or three years I have had an opportunity of representing you before some of the railway corporations. I may say that we have always been received courteously, the representations we have made have been attentively listened to, and we have secured some concessions. We have been able to make out a fairly strong case, but, owing to the fact that the fruit industry has always been looked upon by the transportation companies as one that deals in what they consider to be a luxury more than a necessity of every-day life, and, therefore, one upon which they have been accustomed to levy some of their most profitable rates, it is a difficult matter to disabuse the minds of these officials of that fact, and to bring them to look upon the commodity in which we deal as one of the ordinary necessities of life. They do not realize that during the last few years we have been obliged to sell our fruit on a par with other agricultural products. Until we can make the transportation companies realize this, we shall not get the service and the rates which we feel we are entitled to. The Chairman of the Traffic Association, Mr. J. Earls, gave me to understand that the fruit business was an express business solely; that it was something that required extreme care in handling and special accommodation, and in consequence necessitated a very much higher rate than almost any other commodity. This is not correct. It is true that we require our goods to be carefully handled, and we certainly require that they should be promptly handled; but the railway men overlook the fact when they handle our goods promptly, they get the use of their rolling stock again so much the sooner. I may say that your committee felt that, in view of the negotiations that were under way for the appointment of the Railway Commission, perhaps very little could be done during the past year, so far as the transportation companies were concerned, but the time has now come when the case we ought to present should be got together and made as strong and forcible as possible. I trust that every member will add his quota to the information.

In reference to the resolution which the Chairman of the committee read as to the effort made last year in connection with the express companies, I might say that the companies took no action whatever. I understand, however, that in some sections arrangements made by co-operation have succeeded to a large extent in doing away with some of the difficulties which were met with in freight transportation. Through co-operation we have succeeded in St. Catharines, and at some other places, in securing better rates by assembling our fruit in carload lots. But the express rates are altogether out of proportion, and in that matter we must have relief. In connection with freight shipments, the volume is getting so large that I have no doubt representations can be made that will secure relief in that respect.

L. B. Rice, Port Huron, Michigan: I should like to ask the committee if they, in looking for transportation to the Northwest, have taken into consideration the line of steamers that leave Sarnia every third day, as a means of carrying their fruit in that direction. Our boats that bring down freight go back practically empty, and are only too glad to get freight at almost ballast prices. I think that apples have been carried back as low as five cents a barrel from Port Huron to Duluth. These vessels go to the Canadian "Soo," Port Arthur and Fort William and then to Duluth. It seems to me that this would be a means by which you could ship cheaply to the Canadian North-west, which ought not to be overlooked.

G. C. Caston: Our Canadian boats mostly go back loaded up to Port Arthur. The difference in rates amounts to eighteen cents in favor of the lake and rail route, but then there is the double handling.

Mr. Rice: They may say that they go back full, but I am inclined to doubt it. I would not think of suggesting it for growers who have a long haul to the lake port, but for the western part of Ontario I think it would be a good idea.

Mr. McNeill: I think that the people of Essex County have here an opportunity of developing the fruit industry that they are not taking advantage of. This great North-west trade is practically ours. Speaking as an Essex man, I hope the fruit growers of the locality will appreciate that. Early apples have been a drug in the market in this country for a long time, but the time is coming when they will be a most profitable fruit, and in that case there will be no better shipping point than Windsor.

In reference to the transportation question, we apparently have not done much, but it is only by pounding at it continuously that we can hope to succeed, and we must not relax our efforts simply because we have no tangible results to show. Our grievances are perfectly definite, and I mention them so that it may not be said that we have not positive grievances.

We want, first and foremost, a change in the classification of several fruits. We want apples removed from class five and placed in class eight. Nothing could be more definite than that, and we can produce the best of reasons to show that we ought to have this reduction in classification.

Second: We want different arrangements in regard to mixed cars. We want the privilege of consigning different fruits in the one car, if need be, and we have the best of reasons for wanting it.

Third: We want better local rates. There is a good deal of moving of fruit for short distances, and the rates are extortionate. I have found instances of this everywhere. For the ten miles, for example, from Creemore to Collingwood the rate on cull apples is fifteen cents per hundred. We want a lower rate on cull apples. We want a rate corresponding to the rate on sugar beets. I got a rate of forty cents a ton for almost any distance on my beets. I sent them to Rochester, Michigan. Why should not our cull apples get a corresponding rate? They are no more trouble than beets. It would enable us to save some few of the hundreds of thousands of barrels that now go to waste.

Next, we want lower express rates to correspond with the rates they get on the other side of the line. There is no reason why they should be so high. I would simply make a plain demand that these rates should be cut in two without beating about the bush.

Next, we want a better refrigerator car service. The scheme spoken of by Mr. Caston should be introduced here, and it would have been introduced if it had not been for the greed of the railway. The company operating in the States has thousands of cars and places them wherever they are wanted. There is a central office that keeps a view of the trade of the whole country. Where there are thousands of cars wanted in any given district they send their cars to that district. In this way they transport the fruit product of the district. They commence operations in the south, and as soon as that crop is moved, they move their cars farther north, and then farther north again. Then the return process begins, and they take the fruit crop from the north and move it

south again. By doing this on a large scale they are able to give accommodation to the fruit men that no system of railroads, operating independently of each other, could hope to give. We want the same system in operation here. They want the railway companies to let in these cars, cars that are doing nothing at this particular time, and the company owning them would be only too glad to give us the service.

Next, we want better accommodation at our stations. That alone would very soon pay for the erection of freight sheds. I enquired of Mr. Sherrington whether they had such accommodation as their Association deserves. I went up there lately and found that they were obliged to load their cars right at the open platform. When dinner was called I had several barrels of apples open which I was inspecting. I asked the station master for accommodation for these barrels while I went to dinner, and he could not or would not give it, and refused to be responsible for them. This is the case all over the country. I was at a station last year where there were three carloads of apples standing in the yards exposed to all the inclemency of the weather. These apples went to the old country, and no doubt the greater number of them were slack. That is the principal cause of so many slack apples in the old country. The fruit growers are blamed for it on the other side, and it injures trade.

We also want some proper means of tracing cars. On most well equipped roads on the other side, if you despatch a carload of stuff, the officials can tell you just where that car is at any stated time, and you can inform yourself of the progress of the car from day to day; but here we have not the slightest idea where a car is until it turns up at its destination.

W. L. Smith, "Weekly Sun," Toronto: There is a National Farmers' Congress in the United States in which all farm organizations can be united for the purpose of securing united effort for the attainment of common ends. We have here, in the Farmers' Association, the nucleus of a like organization. Here is the germ of an idea which may be developed into a comprehensive scheme of union. Why should not the Dairy-men's Associations, the Live Stock Associations, the Fruit Growers' Associations, and all other like organizations have accredited delegates to the Farmers' Association? Such a union would be all powerful in regulating freight rates, in urging the carrying out of Dr. Mills' idea for the creation of a national express service, and in making the influence of farmers felt all along other lines in which there is union of interest.

H. W. Dawson: I do not know that I can say any more than I have previously said upon this question. There is no commodity handled by the railroads that pays a higher rate than fruit, and none that gets less accommodation for the money paid, and there is no commodity for which the railways are having so much increased carrying. Mr. Smith strikes it right when he says co-operation is needed. In the past you have presented your case, but have not followed it up. Take the Millers' Association; when they want a cut in rates, they do not stop at the one interview, but follow it up until they get it. That is what the fruit men should do.

E. D. Smith, M.P.: There is no doubt that the fruit growers have a great grievance. We find that other interests in the community can get redress, why should not the fruit growers? Hitherto I have felt that we were to some extent helpless, and that it was more or less a waste of time to approach the railways in the matter, but now we are to have a Railway Commission, and, as Mr. Smith has suggested, if the different organizations could combine and send representatives to wait upon that commission, we shall be able to present our grievances in such a way as to command attention. Now, as to the personnel of this commission. The commission is to consist of three men. If two of these men should be representatives of the railways, we shall not be in any better position than before. This is one of the great dangers, and I think that the first effort of farmers and fruit growers should be to urge upon the Government the necessity of placing at least two men on the commission who represent the producers of the country. I think there will be at least one representative farmer. The farming interests of this country are the paramount interests. The railways make their profits largely by carrying the products of the farms. Therefore, the farming interest.

powerful and important as it is, should be represented on that board by at least one man. This matter is not settled yet, and I think we should devote our attention to it first of all. Then let us send a strong delegation from the different farmers' organizations to press our claims. There is no doubt that fruit is discriminated against. Some of the local charges are simply outrageous. I shipped ten barrels of apples the other day from Port Perry to Almonte, not over 100 miles, and it cost me seventy-five cents per barrel. It would only cost nineteen cents a barrel more to carry those apples to Liverpool.

Mr. McNeill: I shipped two barrels this morning to Walkerville, thirty miles away, and paid just twice the rate that I could ship to Montreal for.

Mr. Smith: One of the greatest grievances we have is the inexcusably long time they take to deliver goods. I have known a car take thirty days to reach Winona from Owen Sound with a load of baskets, and two weeks from my place to Nova Scotia. There is no real excuse for this. In England a freight train will start from any point at six o'clock at night and deliver its freight at Manchester before daylight next morning. I have an agent in Manchester who tells me that for twelve months in succession that train had arrived within thirty minutes of the same time every morning. Their rates are little, if any, higher than ours, and they carry their goods by freight almost as fast as they are carried here by express. If I wish to ship goods from my place to Petrolia on the Michigan Central, where there is no express service, I ship in the afternoon, and they are there on the following morning. This is the greatest grievance I have against the companies—the length of time they take in transportation.

F. J. Barber, Georgetown: While we may not be able to afford to engage a fruit expert to assist us in our dealings with the railways, I think that if all the associations were to unite on the plan outlined by Mr. Smith, the combined expense of employing an expert would not be great, and our interests would be properly looked after.

Mr. Caston: Mr. Smith's remarks suggest another question, and that is the personnel of the commission. Do you think that we as an Association should take action in that connection? If so, it is not too late, but it is not any too early. A great deal will depend on that. Should we appoint a committee of men who are sufficiently well versed on the subject to make a strong enough case before the commission, and, if not, should we do as suggested and co-operate with other societies and have an expert representative?

The President: As to the composition of the commission, when it was first talked of, it was generally supposed that it would consist of five members, and efforts were made looking towards the representation of the fruit men on the commission. It was decided, however, to confine the commission to three, and under those circumstances, a representative of the fruit industry was no longer possible. The idea of co-operation brought out by Mr. W. L. Smith appears to me to be correct with the view of securing one, if not two, commissioners who shall be in touch with the farming interests of the country.

A Member: There is very little use in telling our grievances; we want to formulate them and then see that the matter is properly presented to the commission by the best talent we can employ.

Robert Thompson: I think we should be careful not to make any statements that can hardly be considered fair, as they only weaken our case. In referring to the cost of transportation to local points in comparison with Montreal, in one case the rate is for car lots and in the other for small lots.

Mr. McNeill: I think I am partly to blame for this, and I have to apologize. I only wished to show how absurdly high the local rate was.

On the motion of A. McNeill, seconded by L. Wooliverton, the following were appointed a Committee on Transportation:

Messrs. W. H. Bunting, St. Catharines; R. J. Graham, Belleville; H. W. Dawson, Toronto; D. D. Wilson, Seaforth; W. L. Smith, Toronto; D. J. MacKinnon, Toronto; J. M. Shuttleworth, Brantford.

It was moved by F. J. Barber, seconded by R. L. Huggard, that Messrs. A. McNeill, W. H. Bunting and Murray Pettit be a committee to co-operate with delegates from other Agricultural Associations in the redressing of grievances common to the agricultural interests of the country. Carried.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. McNeill presented the following resolutions on behalf of the Committee on Resolutions:

Growers' Co-operative Organizations.

That in the opinion of this Association, the future development and continued prosperity of the fruit growers of Ontario depends on the formation, in every fruit district, where such does not now exist, of a Growers' Co-operative Organization for the purpose of handling fruit and buying supplies in a co-operative way, and for the further purpose of bringing the united influence of all to bear with a view of securing better transportation facilities in the interests of all.

That for the purpose of developing such organizations, a committee be formed charged with the duty, acting in unison with the local directors, of promoting the work of the organization during the coming winter, and that the President be charged with the special duty of attending meetings called by the local organizations for the purpose of assisting and completing the work of organizing.

That, the Organizing Committee shall consist of G. W. Cady, Leamington, for the western district; Robert Thompson, St. Catharines, for the Niagara district; A. W. Peart, for the Burlington district; A. E. Sherrington, for the northern district, and Wm. Rickard, M.P.P., for the eastern district.

And further, that the Executive be instructed to provide funds to meet the necessary expenses of those named while carrying on the work assigned to them."

On the motion of Mr. McNeill, seconded by Mr. M. Pettit, the same was adopted by the Association.

Encouragement to Canning Industries.

"That whereas, during the season just passed, thousands upon thousands of baskets of tender fruit rotted upon the ground, while in Great Britain, and even in our own country, an ample outlet, at profitable prices, could have been obtained for the same had sufficient means existed for the bringing together more closely producers and consumers.

That whereas, to provide for this bringing together, it is necessary that the bulk of these tender fruits be reduced to preserved form as near the point of production as possible.

That, whereas, one of the main difficulties in the way of securing complete development of this canning and preserving industry lies in the cost of raw materials, other than fruit, the chief of these other raw materials being sugar and packages for holding the preserved article.

Therefore, be it resolved, that this Association respectfully but most strongly urges the Dominion Government to extend to the canning industry of this country the same system of aid already extended to other industries, by enabling them to buy their raw materials at the lowest possible cost, and that to this end the duty on sugar used in canning, and on packages used for holding canned fruit be remitted.

And further, that the Dominion Government be petitioned to secure the enactments of legislation compelling the labelling of all canned preserves in such a way as to show what the canned goods actually consist of, as demonstrated by official analysis; and further, that such goods be distinctly labelled, "Made in Canada."

On motion of Mr. McNeill, seconded by Mr. Woolverton, the foregoing resolution was adopted by the Association.

Mr. Woolverton: Since Mr. Moore is here representing the Department at Ottawa, I think it would not be out of place for me to introduce the matter of ocean transportation in cold storage, so as to give him an opportunity of speaking. I have been making a good many shipments of Bartlett pears to the Old Country, and not altogether with success. We all want to know exactly where the difficulty is, whether with the refrigerator car service or with the refrigerator service on the ocean. I may say that in some instances the cars furnished us at Grimsby have been very excellent, and would, I am sure, transport the fruit safely; in other instances the cars have been very bad, and entirely unfit for such a service.

In a recent issue of the Horticulturist I referred to a shipment of pears made on the S.S. Lakonia. On September 18 the consignee in Glasgow wrote me as follows:

Glasgow, 18th Sept., 1903.

L. Woolverton, Esq., Grimsby, Ontario:

Dear Sir: I beg to send you herewith account sales for your consignments of pears ex S.S. "Lakonia," also statement of account and draft for £191 10s 8d sterling in payment of same, which please acknowledge. As I cabled you to-day, a percentage of these pears landed here in very bad condition, and this I understand was due entirely to the temperature having been kept too high while they were on board the steamer. It appears that the refrigerator chambers were packed full of fruit, and therefore, the cases in the centre of the chamber were blocked out from the air, and it was impossible for the engineer to keep the temperature down sufficiently. The pears were carried at a temperature of 44 degrees to 46 degrees, and I have asked Mr. Brown, the Government Inspector here, whom you saw while you were in Glasgow, to write you on the subject, as he is making a full report thereon to the Government. Some of the cases of pears were in perfect order, and sold remarkably well, but others again were in ripe and over-ripe condition, and it was utterly impossible for us to check them all here, and after the cases were sold we had numerous complaints from customers as to their having got ripe pears instead of green, and we had, therefore, to make allowances to the buyers. You will see the different prices which we had to put the pears in to the purchasers, whereas had the fruit been all in green condition, and take your own consignment as an instance, the A No. 1 would have realized 8s, and the No. 1 6s 6d, but, as explained above, those ripe and over-ripe had to be allowed for. I can assure you we did our very best in your interest under the circumstances, and feel confident that should your next consignment land here in green condition, we shall be able to do well for you. It is a great pity indeed that these pears were not carried at a lower temperature, say from 36 degrees to 38 degrees, as then they would have been in good condition, and the result overhead would certainly have been more satisfactory to all parties. I thought it better when cabling you to-day to let you have the information that the fruit was carried at a high temperature, so that you could fix the matter up with the steamship company, and arrange that future lots be carried at a right temperature. The fifteen boxes of peaches which you shipped were just a mass of decayed fruit, and could not be offered for sale at all. I have also to state that the pears would have looked better if they had been wrapped in paper, and I have no doubt your further shipments, if attended to in this respect, and landed in good order, will turn out satisfactorily. I note from your favor of the 5th that you are shipping by steamer "Sicilian" two carloads, and you can depend on it we shall give these every care and attention, and do all in our power to realize best prices therefor. I am also glad to learn from your favor of 3rd that you have secured Mr. Vandyke as a shipper and that this gentleman has nearly 3,000 barrels which he will forward, and we trust that this is only one of the number of shippers which you will be able to secure. We are advised of a consignment from Messrs. A. H. Pettit & Sons, which they say is coming forward by steamer "Alcides,"

but we have no advice from you in regard thereto, and it is possible these apples will be in the "Sicilian" along with your other consignments. We had a letter from our Mr. Russell, wherein he mentions that there is a large quantity of third-class apples in your district, suitable, perhaps, for preserving purposes here, and we have been making inquiries at all the preserve makers, and regret that they cannot do with these apples, as they have already contracted for nearly their full requirements for the season. I cannot recommend you to ship this third-class grade of fruit, as there would be practically no demand for it here, and if left to the mercies of the preserve makers on this market, they would be inclined to give very little for it, and I am certain it would not pay freight and expenses. I have only to add that there was a strong demand here for the pears ex "Lakonia," and it is disappointing to a great extent that there was such a percentage of ripe and over-ripe fruit, and this may tend to have an adverse effect on next lots; but we shall, of course, examine and show the fruit to the purchasers in such a manner as to retain their confidence and secure their support throughout. I may add that I understand there were some California plums packed in the same chamber as these pears also landed here in bad condition, and the Donaldson Line people should not have put such a great quantity of fruit into one chamber, and should have left air passages so that the temperature could have been kept at a right degree.

Without more, meantime, and waiting your further valued favors,

Yours faithfully,

THOMAS RUSSELL.

About the middle of September I shipped a second consignment by the Allan Line steamship Sicilian. It arrived in such a state that very few of the pears could be sold in Glasgow to bring any money back to me. The following is a copy of a comparison between the chief engineer's log and the thermograph record sent me by the consignee in Glasgow:

Date.	Chief Engineer's log.	Thermo- graph.	Date.	Chief Engineer's log.	Thermo- graph.
Sept. 16th	48	60	Sept. 23rd	34	37
Sept. 17th	46	50	Sept. 24th	35	37
Sept. 18th	42	44	Sept. 25th	33	37
Sept. 19th	41	41	Sept. 26th	35	36
Sept. 20th	40	39	Sept. 27th	36	36
Sept. 21st	40	38	Sept. 28th	35	36
Sept. 22nd	39	37			

From this it appears that on the day the fruit was loaded the temperature in the chamber was 60 degrees F., and that it was four days before it got down to 41 degrees. I submit that the condition of affairs revealed by this statement makes the shipment of our tender fruits entirely out of the question. In isolated instances, where the temperature has been kept at about 33 degrees, peaches and pears have been successfully shipped. A gentleman from this centre did succeed in getting a shipment over, and received a return of \$3 per bushel. I had a similar result myself from one lot that carried in good condition. They were sold at \$3.75. This shows the possibilities of the trade and what an important matter it is to us fruit growers that we should have conditions, both on the railways and on the steamship, to enable us to put our fruit where it will bring the most money. If there is any way by which the Department of Agriculture at Ottawa can help us, and make it possible for us to secure a certain temperature on the steamships, it would mean a great deal to us, and I shall be glad to learn what the possibilities are in this direction in the near future. It matters a great deal to us, because it must to a certain extent govern us in our planting, and it is a long time before we can adapt our orchards to export trade. We want to know, therefore, whether it is ever going to be possible for us to carry our tender fruits to the markets where they will bring us the most money.

OCEAN TRANSPORTATION.

By W. W. Moore, Government Inspector at Montreal.

In the case of the "Lakonia" shipment of the 3rd September last, there is no doubt that the fruit in her refrigerators was carried at a higher temperature than is desirable, the lowest temperature recorded by the thermographs during the voyage being 41 degrees. When her refrigerators were opened at Glasgow it was noted by our Inspector that the cases were very closely stowed, thus making it difficult for the cold air to penetrate to the centre of the chambers. He drew the attention of one of the members of the Donaldson S.S. Company to the close stowage, and urged upon him the importance of having dunnage between the tiers of packages in order to facilitate the circulation of air within the chambers. Upon receipt, by the Department, of our Glasgow Inspector's report, we at once took up with the Montreal agents the question of proper stowage of fruit in cold storage chambers, and as a result of the representation made by the Department, on both sides of the Atlantic, the "Lakonia" on her next voyage had the two after chambers specially fitted for the carriage of fruit. Battens were laid crosswise on the floors of the chambers, and strips 3-4 of an inch thick were placed between each tier of cases. Six ventilating trunks were also put up in different parts of each chamber. Thus fitted, she sailed from Montreal on October 15th with about 1,000 cases pears and about 3,000 cases boxed apples, all in cold storage. This fruit was landed in Glasgow in splendid condition; but I want to emphasize the fact that it first went aboard the steamer at Montreal in excellent condition for shipment.

The S.S. "Sicilian" Shipment.

On the voyage in question this steamer left Montreal on Sept. 17th, with 2,000 cases California plums, 1,000 cases California pears, and 1,144 cases Canadian pears, all stowed on the port side refrigerator. The Canadian pears were from the following shippers: E. D. Smith, through Hart & Tuckwell, 402 cases; L. Woolverton, 742 cases. Mr. Woolverton's shipment arrived at Montreal in refrigerator car on Sept. 9th (eight days before the steamer was advertised to sail), and was delivered on the 10th to the Union Cold Storage Co.

Mr. Carey, Dominion Fruit Inspector, examined Mr. Smith's pears on the 15th, and reported re condition as follows: "I did not count fruit, but in my opinion about 50 per cent. were ripe or showing yellow color." Mr. Smith's shipment was also reported by Mr. Morrison, Cargo Inspector for the Department of Agriculture, Montreal, and by Mr. Woodard, Official Referee, Butter and Cheese, Montreal. The former reported "about 50 per cent. ripe," while Mr. Woodard wrote: "There is no question but what Mr. Smith's fruit was over-ripe before leaving this side, and should never have been sent."

Regarding Mr. Woolverton's shipment, Mr. Morrison reported that on the 15th the pears were in "fair condition, some over-ripe," while Mr. Woodard's report reads: "One lot marked 'L.W.', about 25 per cent. ripe; another lot marked 'L. Woolverton,' about 45 per cent. ripe."

The loading of the pears and plums into the port chamber was commenced about 2 p.m. on Sept. 15th, and was continued until the chamber was filled. The Department's thermograph was placed in the chamber as soon as the fruit began to go in, and the chart shows a temperature of 47 degrees at 12 o'clock that night. Beginning with Wednesday, the 16th Sept., the highest and lowest temperatures in each 24 hours during the voyage, as recorded on the chart, were as follows:

	Highest.	Lowest.
Wednesday, Sept. 16.....	46 deg.	39 deg.
Thursday, Sept. 17 (sailed).....	41 deg.	40 deg.
Friday, Sept. 18..	39 deg.	38 deg.
Saturday, Sept. 19.....	39 deg.	38 deg.
Sunday, Sept. 20.....	37 deg.	37 deg.
Monday, Sept. 21	38 deg.	35 deg.
Tuesday, Sept. 22..	36 deg.	34 deg.
Wednesday, Sept. 23.....	35 deg.	33 deg.
Thursday, Sept. 24.....	34 deg.	31 deg.
Friday, Sept. 25.....	33 deg.	30 deg.
Saturday, Sept. 26	33 deg.	31 deg.
Sunday, Sept. 27..	34 deg.	31 deg.
Monday, Sept. 28—vessel arrived at Glasgow.		

Considering the ripe condition of a large portion of the Canadian shipment, as established by the reports of our Inspectors, and the consequent difficulty in cooling the fruit quickly, it must be said in all fairness to the steamship company that the above record is a very creditable one indeed.

When the cold storage fruit was discharged at Glasgow, it was examined by our Inspector, Mr. Brown, who reported as follows :

"Nearly all the Bartlett pears were practically useless. They were carried along with 2,000 cases plums and 1,000 cases Californian pears. The plums were in splendid condition, and the Californian pears were also good, with the exception of some B. Hardy's, which were sleeping."

It should be noted that the Californian fruit turned out in good condition, although the Canadian fruit, carried in the same chamber and at the same temperature, turned out in a worthless condition.

In his details of each particular lot, Mr. Brown writes :

"E. D. Smith—These were all Bartlett pears, all of which were nearly useless."

"L. Woolverton—742 cases pears and 147 cases apples, all in cold storage. The pears, principally Bartletts, were in a very wasty condition, the fruit evidently having been too ripe when shipped. Several small lots of Flemish Beauty arrived in good condition, fruit being firm and green. The apples in the cases were very good."

Now, these reports from which I have quoted were made by men both competent and disinterested, and their evidence touching on the condition of the fruit, together with the thermographic record for the voyage, establishes conclusively, to my mind at all events, that the bad condition of the Canadian pears ex the "Sicilian" was not due either to faulty cold storage facilities on the steamer or to lack of attention on the part of the ship's engineer. While I hold no brief from the steamship people, and am not here to defend, or apologize for, any of their sins, whether of omission or commission, yet facts are facts, and the only way in which those occasional failures in the shipping of tender fruits can be avoided is by first determining just where the fault really lies, in order that the proper remedy may be applied. Some people would have us believe that our ocean cold storage system is very defective. No doubt it can and will be improved, because every year great strides are being made in the science of mechanical refrigeration, but if the cold storage facilities on the St. Lawrence route are inadequate, how is it that American shippers send so much of their early fruit via Montreal, seeing that they have a choice of routes? This year, up to Nov. 20th, the number of packages of tender fruit shipped from Montreal in cold storage was as follows :

Canadian pears	9,337 cases, 27 half barrels.
United States pears, plums and peaches	9,950 cases.

Total.....	19,287 cases, 27 half barrels.
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Mr. Woolverton: Can you explain why there is such a difference in our records. I have here the chief engineer's log and the thermograph record?

Mr. Moore: Where did you get the thermograph record?

Mr. Woolverton: From the consignee.

Mr. Moore: I have the official record taken from the machine. There is nearly always a difference between that and the chief engineer's thermograph, because it is in a different part of the chamber, namely, about the centre of the ceiling, where it would be warmer. The readings I am giving are from the official chart.

Q.: Were there not several thermographs on the ship?

Mr. Moore: One in each compartment.

Q.: Is it not possible that Mr. Woolverton's record was taken from another thermograph?

Mr. Moore: That may be.

Mr. McNeill: Was this thermograph unlocked in Great Britain?

Mr. Moore: No, it was not.

Mr. McNeill: It would be impossible for the consignee to get the record then.

Mr. Moore: Our agent over there has the keys, and he sometimes opens the box and looks at the charts, but never takes them off.

Mr. Woolverton: Then, doubtless, it was obtained in this way.

Mr. Wilson, London: I think I saw it stated in the Horticulturist that in these pear shipments the wrapping of the fruit was omitted. All delicate fruit should first be wrapped in thin wax paper, and then wrapped again in ordinary tissue or thin Manila paper. The air between the papers will act as a non-conductor, preventing condensation taking place, or injurious gases or germs reaching the fruit.

E. D. Smith, M.P.: In reference to these shipments of pears, it is only fair to say that my pears, as well as some of Mr. Woolverton's, were detained in Montreal. I think I know how to pack pears hard enough for the old country. I have shipped some cars with the greatest success. The shipment I refer to left in the best condition possible, but they arrived in Montreal, owing to the delay of the railway company, a little too late for the boat. I had sold them to a man in Montreal, but he refused them on that account, as he did not want to take the risk of holding them over for another boat. I therefore ordered them to be sent at once to cold storage, where they were for three or four days. They were shipped from Montreal seven or eight days after they left my place. On hearing Mr. Moore's report, one would certainly think that the fault lay somewhere else than on the steamer for their not arriving in good condition, especially as the inspector states that the pears when placed on the steamer were over-ripe. But I also have the report of my agent in Montreal, who examined the fruit when it was first taken from cold storage. I authorized him to examine the fruit, and do whatever he thought best with the shipment—to ship to the old country if they were in good condition, otherwise to sell the consignment in Montreal. If they had been sold in Montreal, the agent would have made a commission, but, notwithstanding this, he concluded to ship to the Old Country, consigning them to Thos. Russell, a responsible firm, who sent their returns to me. My Montreal agent reported that the fruit was hard and green, and in excellent condition, and I can see no object in his telling me this if it were not the case. It is possible that he examined different packages to those examined by the inspector. At any rate, the result of the shipment was a debit charge of twelve pounds.

If I had not got the thermograph record from the steamship people as well as from the Department, I might still think that my agents in Montreal were mistaken as to the condition of the fruit, but here I have not only the engineer's record, but the thermograph record kept by the steamship people. This was sent me in reply to a complaint and demand for damages. Now, the Department's thermograph record gives the temperature on the second day at about 40 degrees, but the engineer's log shows 48 degrees, and the company's record shows 60 degrees. On the next day the Government record shows from 40 degrees to 38 degrees; the engineer's log gives 46 degrees, and

the company's record 50 degrees. And so on, every day there is a discrepancy, there being a difference of ten or fifteen degrees on some days, but gradually getting nearer until the ship reached the other side. That shows that these thermographs were placed in different parts of the compartment, and that an enormous difference in temperature existed in different parts of the compartment. Now, we have records of 30 degrees, and as there is such a wide difference in the three records, it is quite possible that there were places in the chamber where the temperature went a good deal lower than 30 degrees. If the thermograph showed 30 degrees in the centre of the chamber, what would be the temperature along the coils? Perhaps the fruit there was frozen?

I took the trouble to look through the records of last season's shipments in cold storage, including butter, cheese, and fruit. I found that some of the records were pretty perfect, in which case the goods arrived in good condition, and were sold at a good profit, but in one case out of three the record varied too much, and the chamber was either too hot or too cold. I am forced to conclude that fruit near the coils may be frozen, while in other parts of the same chamber it may be ruined by being too hot. If Mr. Woolverton had not had the same experience as I had, I should have concluded that the fruit went on board in bad condition, but with the evidence I have before me, I am satisfied that fruit was injured on the steamship that ought to have gone over sound.

I am aware that the Government has now no control over these boats. Since the heavy subsidies expired, the Government has, unfortunately, had no control whatever. If we cannot carry Bartlett pears over, what folly it is to talk of shipping peaches and plums. But in my own simple ice storage house, I can carry them for six weeks in perfect condition. What is the reason, then, that we cannot send them for a ten-days' trip across the Atlantic on boats that are fitted up at great cost with the most approved machinery and appliances?

I observe that Mr. Moore mentioned the fact that a consignment of California fruit in the same shipment arrived in satisfactory condition. But we must not forget that the California fruit is not as perishable as ours. They can carry their peaches, pears and plums clean across the continent in their cars, and they arrive perfectly sound. I have seen their plums stand in the cold storage for six weeks without rotting. Their fruit is grown in a climate where they have no rain, and is of such a texture and character that it will carry far better than ours, so that there is no comparison.

Mr. Moore: Mr. Smith has referred to the record of the company's thermograph. The company has no thermograph. There is only one thermograph in the chamber, and that is the Department's. If he received any thermograph record from the company that does not agree with the record I have, he received a record from a thermograph from one of the other chambers.

Mr. Peart: So far as the shipment of pears is concerned, we in the Burlington district have very little confidence in the steamship accommodation. I sent a shipment of Duchess apples over, and the record showed a temperature of 38 degrees. Consequently, they arrived in Glasgow in splendid condition, and were so hard that the consignee actually held them over for a week, and we received very high prices for them. When we ship apples to the Old Country we feel confident that in ninety-nine cases out of a hundred they will arrive in good condition; but with pears it is very doubtful, indeed, and our idea is that the storage on board ship is unreliable.

Mr. MacKinnon: I think we are losing sight of one end of the question. We are not here to represent the steamship companies, but are just as anxious as you are to secure better transportation. What about the refrigerator cars, are they perfect? Is the proper temperature maintained in the car? The temperature maintained in the car containing Mr. Woolverton's first shipment was from 53 degrees to 56 degrees. Should we not do something to secure a satisfactory temperature in these cars, say of 40 degrees to 44 degrees?

Mr. Bunting : My experience with cold storage is that it is possible to keep pears in good condition for several weeks, provided they come into cold storage in proper condition. But if the fruit is partly ripened before being placed in cold storage, it is impossible to check it afterwards. I think that in the various sections there should be proper local cold storage equipment for this purpose, so that immediately after fruit is taken from the trees it can be put in cold storage in process of packing. It is difficult to assemble entire carloads of pears for shipment, and during the interval the ripening process is going on. Probably this would account for the fact that the pears examined by Mr. Smith's agent in Montreal were green, while those examined by the Government inspector were commencing to mellow. My experience leads me to believe that it is more important to have the beginning of the system perfect than the end.

Mr. Hammond : After fruit has been in cold storage for a certain length of time, it becomes very cold. If it is then exposed to the warmer air outside, it will condense moisture from the atmosphere on its surface. It is afterwards returned to cold storage, it goes in soaking wet, and is in a very bad condition to keep. I have been at this work for quite a few years, and know that this is the case. The storage is not often of such a character as to dry the fruit. On some of the steamships there are fans for creating a current of air that will dry up the moisture, but in others I have been on, there are not. If the conditions were such that the fruit could be put into cold storage and kept cold till it reached its destination, without involving exposure to the warm air, it would be in a much better condition.

Mr. Smith : In reference to the thermograph records, I wish to say that I have just made a comparison of the records which I supposed was the company's record with records from other chambers, and there appears to be no doubt that a mistake has been made, and that the record sent me was the record of another chamber on the boat.

Mr. Pettit : Is not the fruit sometimes exposed at Montreal from the time it arrives in the refrigerator car until the time it goes on board ship, for several hours, perhaps a whole day ?

Mr. MacKinnon : I am aware that sometimes these delays have occurred. We have asked our inspectors to notify us in such cases, and to use their best efforts to secure prompt transfer to the steamer.

Mr. McNeill : I have noticed that the editor of the Horticulturist, in writing for that journal, whenever he has a chance is inclined to put the whole blame on the steamship companies for the failure of some of the cold storage shipments to Great Britain. I come before this meeting in full sympathy with the fruit growers in this matter, and maintain that we must have an impartial analysis of the conditions that underlie this matter. I have given it very careful consideration ; I have examined all the conditions. I have watched the operation from the picking of the fruit until the time when it was placed upon the steamer, and, having done so, I give it as my unprejudiced opinion that the strongest link in the chain of transportation is the steamship company ; it is the very best of all the links from the orchard to the market. Still it is not perfect. The Lakonia shipment was not perfect ; the steamship company was to blame a little ; but, taking the Sicilian shipment, I cannot see how any man who has had Mr. Woolverton's experience could expect that shipment to go to the Old Country in good condition after it had been rattled over the Montreal pavements for two miles from the cool storage on the train to the cold storage warehouse through the heat of a September day.

Q. : Why should not the car have been run into the cold storage building ?

Mr. McNeill : That is exactly it ; that is what we want to get at.

Q. : Who has the power to correct that ?

Mr. McNeill : Mr. Woolverton himself. Why does he not take that matter up ? The Department has no control over it.

Mr. Smith, "Weekly Sun" : But the individual worker cannot look after these things : if the Government has not the power, it ought to take the power.

Mr. McNeill: That is what I want our committee to take up. I do not ask Mr. Woodveiton to do that personally; it is the work of our committee.

Mr. Smith: This matter should not rest upon the Association; it should rest upon the Government.

Mr. McNeill: I want to point out at what stage the difficulty with this particular shipment arose. The fruit was taken from the cold storage on the train out into the moist, warm air, becoming heated up. It then goes back into cold storage and is cooled off. It goes through the same process again six days later on its way to the steamship; there is another warming up and another cooling down. In consequence of this, I claim that the fruit was spoiled before it was placed on the steamship at all, and if that is the case, what is the use of blaming the steamship company? Experiments at Washington have proved that the most important point in the whole system is to have cold storage right at the beginning, immediately the fruit is picked, so that it is not allowed to begin to ripen, as if the ripening process is once started it will go on more or less in spite of the fact that the fruit is afterwards placed in cold storage. My charge is that it is we fruit growers who are to blame rather than the steamship companies. The steamship companies are not doing their whole duty, and the railroads far from their duty, but neither are we doing ours.

Q: In what way?

Mr. McNeill: By not cooling our fruit down immediately it is picked and keeping it cool. The fruit growers must cool their fruit, and we must have a better refrigerator car service. I suspect that this is worse than the steamship service.

FRUIT PACKAGES.

By A. McNeill, Fruit Division, Ottawa.

In introducing the subject, Mr. McNeill called attention to two charts, showing the Canadian and foreign box dimensions, as follows:

CANADIAN.	Dimensions.	Capacity.
British Columbia.....	$9\frac{3}{4} \times 11 \times 20\frac{1}{4}$	2225
" ".....	$10\frac{1}{2} \times 11\frac{1}{2} \times 18\frac{1}{4}$	2200
" ".....	$10 \times 12 \times 18\frac{1}{2}$	2222
" ".....	$10 \times 11 \times 20$	2200
" ".....	$10\frac{1}{2} \times 11\frac{1}{2} \times 18\frac{1}{2}$	2177
Inglehart & Garner.....	$9 \times 14 \times 20$	2520
J. D. Sherwood, N. S.....	$10 \times 11 \times 20$	2200
J. W. Brennan, Grimsby.....	$10\frac{1}{2} \times 11\frac{1}{2} \times 22$	2656
Burlington Shippers.....	$9 \times 12 \times 18$	1945
R. J. Graham.....	$11 \times 11 \times 22$	2662
Brockville Box.....	$10\frac{1}{2} \times 11\frac{1}{2} \times 22$	2656
" ".....	$9 \times 12 \times 24$	2592
J. Guest, Lucan.....	$10\frac{1}{4} \times 10\frac{1}{2} \times 20\frac{3}{4}$	2252
Imperial Bushel.....	2218. 2
" Quart.....	69. 3
Wilson Bushel.....	$10\frac{1}{2} \times 10\frac{3}{4} \times 20\frac{1}{2}$	2219
FOREIGN.		
California.....	$9\frac{3}{4} \times 10\frac{1}{2} \times 19\frac{1}{2}$	2064
Idaho Standard.....	$10\frac{1}{2} \times 11\frac{1}{2} \times 18$	2174
" Special.....	$10 \times 11 \times 20$	2200
Colorado.....	$11\frac{1}{2} \times 11\frac{1}{2} \times 20$	2413
Arkansas.....	$9 \times 12 \times 20$	2160
Oregon.....	$10 \times 11 \times 22$	2420
Oregon, W. A. M.....	$9\frac{3}{4} \times 11 \times 20\frac{1}{4}$	2172
Washington, 1st.....	$10 \times 11 \times 20\frac{1}{4}$	2241
" 2nd.....	$10\frac{1}{2} \times 11 \times 18$ 9-16.....	2148
Missouri.....	$10\frac{1}{2} \times 11\frac{1}{2} \times 18$	2174
Montana.....	$10\frac{1}{2} \times 11\frac{1}{2} \times 18$	2174
California, W. & Co.....	$9\frac{3}{4} \times 10\frac{3}{4} \times 11\frac{1}{2}$	2148
" J. M. S.....	$10 \times 11\frac{1}{2} \times 21\frac{1}{2}$	2418
Tasmania.....	$10 \times 11 \times 20$	2200

I propose to-day to speak of the size of a standard Canadian apple box, having special reference to a recommendation that may be found suitable for the fruit growers of Nova Scotia as well as those of British Columbia. There is sufficient fruit shipped in boxes to create an interest, and yet not so much that there will be any serious disturbance to the trade by adopting a standard package. Recognizing that this is a national question, and not a Provincial one, I will submit to you a very large correspondence with representative men in all parts of the Dominion. I make no apology for offering you first a letter from Mr. W. A. MacKinnon, Chief of the Dominion Fruit Division. Mr. MacKinnon spent one year in England, and previously had much experience, in connection with the Paris Exposition, in fruit, and has since made this matter a subject of special study. I have no hesitation, therefore, in saying that he is as well qualified probably as any man in the Dominion to pronounce upon the subject :

A. McNeill, Esq. :

In answer to your enquiry regarding a standard apple box, I will say that there is undoubtedly a large and increasing demand in Great Britain for the finest class of Canadian fruit put up in a box to hold from 40 to 50 pounds of fruit. The majority of dealers on their own account suggested 40 pounds net, but I believe it is a matter of comparatively little moment whether the package holds 40 or 50 pounds, so long as the net weight lies between these figures. It is, however, of the highest importance that Canadian shippers should all use the same size. The British trade complain bitterly that they never know until they have opened the package and weighed the contents how much fruit they are to get in the Canadian box. Even the dimensions do not assure them of this, owing to the free use which some packers make of excelsior.

Since the great desideratum is uniformity, and since it is difficult to change a custom once established, I think the Association should take measures to co-operate with the Fruit Growers' Associations in the other Provinces in order to agree upon a standard box for the whole of Canada. Whether there should be legislation to compel adherence to this size is a question which need not be discussed here.

The British Columbia Association has already recommended the use of what they call the "California" package, measuring 10" x 11" x 20", inside. This package is also in use in Oregon and in some parts of Nova Scotia, and some of the Tasmanian boxes are of the same dimensions. Having already obtained the sanction of somewhat widespread usage, it appears to me that this size should have the serious consideration of your Association as being one which has a better chance of being universally adopted than any of the odd sizes which are found at different points in the country.

Yours truly,

W. A. MacKinnon,

Chief Fruit Division.

Though this letter covers nearly all points of the subject under discussion, it will still be interesting to note what others have to say. Mr. E. Cumming, Melvern Square, N.S., writes to the Fruit Division as follows :

"I am thinking of sending my Ribstons and Kings in such boxes this year, but, not knowing the exact measurement of a bushel box, would you kindly send me the proper dimensions for the inside of the boxes, and instructions how to pack them, and whether they should be wrapped in paper or not?"

This is only one of many letters which show the increasing interest in this subject, and the necessity of coming to some conclusion in the matter of an apple box. That the Canadian trade is seriously hampered at home is well shown by the following extract from a letter from Mr. G. W. Hunt, of the Ottawa Fruit Exchange :

"Growers have resorted to all manners of packages this year. We have received boxes ranging in size from 10 x 12 x 18 to dry goods cases, containing about two barrels and a half. I would recommend a medium size, holding as nearly as possible one bushel. This package would be very convenient for more reasons than one. The principal one

that I would mention here is the fact that a great number of our Fameuse or Snow apples go to the United States, and if we use a bushel box we pay duty for that and no more, but if the box holds less than a bushel we pay for a bushel anyway, and the duty is 25 cents a box."

But it is not only the home market that is injured by the want of uniformity in packages, the foreign market is very seriously affected. I quote from a report made by G. H. Vernon, Dominion Fruit Inspector, who spent some time in Covent Gardens and other London markets last summer :

"Length $20\frac{1}{2}$ inches, width 11 inches, depth $9\frac{1}{2}$ inches. Thickness of ends $\frac{5}{8}$ inch, sides $\frac{1}{4}$ inch, of soft wood, and quite light."

"Tasmania box—length $18\frac{1}{2}$ inches, width 14 inches, depth $8\frac{1}{4}$ inches. Thickness of ends $\frac{3}{4}$ inch, sides $\frac{1}{4}$ inch, hardwood, resembling oak, and quite heavy."

"California box—length $18\frac{1}{2}$ inches, width $11\frac{3}{4}$ inches, depth $8\frac{1}{2}$ inches. Thickness of ends $\frac{3}{4}$ inch, sides $\frac{1}{4}$ inch, soft wood and light."

"I heard a great many complaints about the Canadian box on account of the variation in the size. A box containing forty pounds is about the right size for the English market."

"Not many boxes are wanted for the export apple trade. In fact, only a few choice apples should be shipped in boxes. The barrel is the proper package for the great bulk of Canadian apples."

Mr. Russell, a very large dealer in Glasgow, writes as follows :

"In regard to packing of apples in boxes I consider this package should only be used for No. 1 fruit, as the demand for apples packed in this way is only for better class trade, and, in fact, anything apart from really fancy stock sells as well if not better, in barrels than in boxes. This package should weigh on an average from 50 to 54 pounds gross, and the use of excelsior among the apples (unless for soft varieties) should be discontinued."

I have prepared a chart giving the dimensions of a few of the boxes in use in Canada as well as among our competitors. This will show the great diversity of sizes. The only apparent uniformity is in the capacity, and here we can get a number of the boxes that are nearly of the same size.

Mr. Maxwell Smith, Dominion Fruit Inspector for British Columbia, writes as follows :

"I beg to say that there are three distinct styles manufactured and used in this Province, namely, $20 \times 11 \times 10$; $18\frac{1}{4} \times 11\frac{1}{2} \times 10\frac{1}{2}$; and $18\frac{1}{2} \times 12 \times 10$, all of which contain nearly the same cubic inches, but the first-named is the box which has been repeatedly recommended and endorsed by the British Columbia Fruit Growers' Association as being the most desirable shape and style, and the box in which the greatest variety of apples could be packed. There are other styles of boxes also used for shipping fruit in British Columbia, viz., salmon boxes, chicken coops, etc., all sizes, but we are discouraging that sort of thing as much as possible, and they are rapidly disappearing."

"The $20 \times 11 \times 10$ box is what is commonly known as the California package."

British Columbia is using nothing but boxes for all grades of fruit, and it is extremely improbable that the barrel will ever come into general use there. Their opinion, therefore, deserves special consideration. Though they are still quite young in the fruit business, they have used more boxes perhaps than the older Provinces. Nevertheless, as this letter shows, there is no uniformity there. Owing to the fact that fruit comes into British Columbia in large quantities from the States to the south of the border, the British Columbia people are obliged to pay some attention to the boxes their customers thus become familiar with, which probably accounts for some of the variations in size.

Mr. Geo. Lamberson, Secretary of the Board of Horticulture, Portland, Oregon, writes :

"Replying to your favor in the matter of sizes of the California apple and pear boxes, will say the apple box is $9\frac{3}{4}$ inches deep ; 11 inches wide ; $20\frac{3}{8}$ inches long, inside

measurement. The pear box is $8\frac{1}{2}$ inches deep ; $11\frac{3}{4}$ inches wide ; $18\frac{3}{8}$ inches long, inside measurement."

Mr. W. J. Brandrith, Secretary--Treasurer of the British Columbia Fruit Growers' Association, says :

"This Association recommends a box having a capacity of 20 x 10 x 11, inside measurements, and we are of the opinion that having always used boxes we are in a better position to advise as to the requirements than our eastern friends can be. However, what we want is a lawful standard box, as at present anything is a box of apples, from 35 to 50 pounds."

The Nova Scotia people, though growing more fruit than in British Columbia, have only lately become interested in the box question. Mr. S. C. Parker, Secretary of the Nova Scotia Fruit Growers' Association, writes :

"Re standard apple box. There has been no particular demand for box shipments from this Province. The question has been discussed in the Association from time to time, but without action."

The question may very well be asked, is any one of the sizes used to so great an extent that the changing of it would impose any great hardship upon the shippers who had adopted it. This, I think, must be answered in the negative. It is very true that several individuals are perfectly certain that they have the only box that should be adopted, and will consider themselves aggrieved if any other is selected.

Messrs. Inglehart and Garner have been using a size 9 x 14 x 20 for one or two years, and have made somewhat large shipments. A few miles from this firm are the Burlington shippers, who use a size 9 x 12 x 18 ; and just around Burlington Bay is Mr. Brennan, of Grimsby, using a size $10\frac{1}{2}$ x $11\frac{1}{2}$ x 22. Now, no doubt, each of these thinks that his box possesses some special merit, but when you come to look at the measurements of capacity you will find that the Burlington shippers are giving 1,945 cu. inches of space, that Mr. Brennan is giving 2,656 cu. inches, which is nearly a fourth more. We find that Mr. R. J. Graham, of Belleville, is shipping very largely a box 11 x 11 x 22, that has about the same capacity as Mr. Brennan's box. His neighbors in Brockville are shipping a box $10\frac{1}{2}$ x $11\frac{1}{2}$ x 22, agreeing in capacity with Brennan's box. Mr. Brennan writes as follows : "I am at present packing apples in cases and trying different sizes, and find that 22 x $11\frac{1}{2}$ x $10\frac{1}{2}$ is the only size in which I can pack four sizes of apples correctly graded, and have each box snugly packed without using excelsior. I have used 22 x $11\frac{1}{2}$ x $10\frac{1}{2}$ for four years, and trust that any other size will not become legal, for after thorough study it is the only box. But against this you must place the following from Messrs. Stirling & Pitcairn : "We shall be reluctant to have once more to change the size ($10\frac{1}{4}$ x $11\frac{1}{2}$ x $18\frac{1}{2}$) of our boxes, as they have been changed so often during the past few years. One reason anyhow for our adopting the box we now use was that when we ship to the market in the Kootenay we come into competition with apples shipped in from Washington and Oregon, and it is necessary to have a package similar to what is used on the other side," and so it goes. It is evident that we must run contrary to the feelings of a number of individuals if we propose a standard box. All things considered, the size that appears to meet with most general approval is a medium between the smaller and the larger. The smallest size which, as you see here, 9 x 12 x 13, has been condemned in the British market as containing too small a quantity of fruit. The largest size is not only awkward to handle, but contains more apples than the buyer will give the box credit for, and consequently the box that appears to meet the general needs of the case is the one sometimes called the "Tasmanian," 10 x 11 x 20.

Mr. Wm. Wilson, the proprietor and inventor of the Wilson case, has given a very great deal of attention to this matter of boxes, and his conclusions are worthy of respect.

"One-quarter-barrel-case, 18 x 12 x 9, holds just 28 quarts, or about 40 lbs. of apples, and is equal to one-quarter barrel of 112 quarts, the former size of barrels, and, while

18 x 12 x 9 is a very economical size case for packing apples, it has no exact proportionate relation, either to the standard bushel or barrel of to-day."

"One standard bushel case can be made for 12 cents, whereas the quarter-barrel costs 10 cents."

"The cost of dock dues in Britain is charged per package, within certain limits, so that bushel cases would cost same as $\frac{1}{4}$ barrels."

"One bushel, being a standard measurement everywhere, as well as an exact proportion of a barrel, is, therefore, the only proper standard for a national package, whereas calculations made by the $\frac{1}{4}$ barrel would only produce confusion and friction between buyer and seller."

"Half-bushel cases are also very convenient, and in exact proportion for the finer fruits."

"Bushel-cases have an advantage over barrels in ocean freight, for while 5 barrels are charged as one cubic ton, it takes about 24 bushel-cases to make 40 cubic feet."

Mr. Brandrith's views are corroborated by Mr. Palmer, Freight Rate Commissioner for British Columbia, who writes:

"So far as British Columbia alone is concerned, the 10 x 11 x 20 size would be satisfactory. I feel safe in stating that if this box is selected as the Canadian apple box, packers will soon adjust themselves to the situation and modify their mode of packing to suit. The present unsatisfactory state of affairs is due to the fact that there is no standard size. I favor this size, as it dispenses with fractional measurements. I recommend this for the standard Canadian apple box, and am convinced that it will give general satisfaction if adopted. The other size mentioned, 9 x 12 x 18, is an impossible package for the Pacific coast trade."

"I regret to state that no one size of box is universally used in British Columbia. The two sizes mentioned— $10\frac{3}{4}$ x $11\frac{1}{2}$ x $18\frac{1}{2}$ and 10 x 11 x 20—are mostly used, and you will note, have practically the same cubic capacity. The shorter and deeper box permits of the better packing with large-sized fruit, but it is not, in my judgment, so good a box for general use as the other one, which is also the box used by Oregon and California apple packers for London shipments. All sizes of apples can be packed in the latter, but for fancy trade only four of five tier fruit is used."

Mr. Hunt, of the Ottawa Fruit Exchange, also touches upon this subject, and I would draw particular attention to his reference to the sale of apples in the United States. This is a large and growing trade, and if the day should ever come when Canada and the States would have a common sense reciprocity treaty the United States would be our largest and best market for fancy apples. As the people of the States are showing evident symptoms of a strong desire to reciprocate in trade matters, it would become us to note the signs of the times, and be prepared for it. It will be a happy day, indeed for the Canadian grower when he can secure access to the southern markets.

Summing the matter up, I would conclude that this Association could not do better than to join with the other Provincial fruit growers' associations in recommending the size, 10 x 11 x 20. British Columbia, as will be seen from the letters of Mr. Palmer and Mr. Brandrith, has already adopted this size, and we have Mr. Parker's assurance that Nova Scotia will adopt it. Mr. MacKinnon has strongly recommended this size. I therefore move for the purpose of getting it before the Association that this size and capacity be adopted.

Mr. Woolverton: I am glad to second the motion adopting that size. I have used about 6,000 boxes this year in shipping to the old country, and have been using 9 x 12 x 18, aiming to ship a forty-pound box, as I have understood from a good many of the consignees that such a box would suit their trade, but in taking this box and weighing it, I found it came a little short of the requirement, and is, therefore, not quite satisfactory. In many ways a box holding about a bushel would be more satisfactory. The size given would be the most satisfactory size to pack, fitting the size of the apples very well.

Mr. Smith: I do not think that this question ought to be decided off-hand; it is too important, and ought to be discussed by a fairly large committee. I agree with the arguments in favor of a standard box; it is ridiculous that we should have so many different sized boxes. The same arguments that applied to uniform baskets will apply to uniform boxes. My idea is to have a box with a capacity of a third of a barrel. The larger the box, so long as it is convenient to carry and handle, the more economical it is. I should deprecate strongly any box smaller than this. Then the question is, which barrel is to be taken as the standard? The box proposed would contain a third of the Nova Scotia barrel, but would have to be somewhat larger to contain a third of the Ontario barrel, and we must decide upon which to adopt. The arguments in favor of the large barrel are strong. We have the reputation in the British market of having a big barrel, bigger than the American barrel. We sell to experienced dealers who know the difference between the sizes and are willing to pay for the difference.

Mr. Thompson: I think that the barrel question will settle itself. A great many of our packers are using a 28-inch stave barrel, and I think it is only a question of time when all will be using the Nova Scotia barrel.

Mr. McKinnon: That is our experience in observing the shipments going forward this year. There is no doubt that the Nova Scotia barrel will sell for just as much in London as will the Ontario barrel, and it looks as though Ontario shippers were beginning to think this.

A committee, consisting of Messrs. Wilson, E. D. Smith, L. Woolverton, A. W. Peart, Robert Thompson, was appointed to consider the matter and report their decision to the meeting.

The Committee on Fruit Boxes presented the following report:

Your Committee would recommend that the Canadian Commercial Apple Box be one of which the cubic contents are about one-third of the Canadian commercial apple barrel, and measuring inside ten inches deep, eleven inches wide and twenty inches long; and that the Canadian pear box be one-half the capacity and half the depth of the apple box; and that the Secretary communicate with the Secretaries of the Fruit Growers' Associations of other Provinces in reference to uniformity in this matter.

On motion of E. D. Smith, M.P., seconded by Wm. Rickard, M.P.P., the report was adopted.

PEACH GROWING IN MICHIGAN.

By Professor L. R. Taft, Agricultural College, Michigan.

The expression "Michigan fruit belt," or "Michigan peach belt," is often heard, but many persons have an incorrect idea if they think that the only place in the State in which peaches can be grown successfully is in the tract to which the above terms are commonly applied, which is a strip from five to twenty miles in width extending along the east shore of Lake Michigan nearly to Mackinaw. Scattered all through the southern portion of Michigan there are thousands of orchards, many of them of considerable size, which are nearly if not quite as productive as in the famed "peach belt." The difference is that, away from the influence of the lake, the peach can only be successfully grown upon ridges where good air drainage can be secured, while in the counties along Lake Michigan little attention need be paid to the elevation, provided the soil is not wet, and, hence, in the peach belt a large proportion of the land is given up to peaches.

Location and Exposure.

The prevailing cold winds are from the west, and, as they pass over the broad and deep waters of Lake Michigan, which never freeze, they are tempered, so that if forty degrees below zero in Wisconsin, it is seldom more than ten degrees below zero in Mich-

igan within five miles of the lake. Even in that section it has been thought that only the more elevated portions should be used for peach orchards, but less attention is now given to the matter of elevation, as thousands of acres of comparatively low land and level land have during the last ten years been set to peaches, and the trees have been fully as productive as upon the higher land. In the interior counties of the State the mercury occasionally drops to twenty degrees below zero, and in selecting a site for a peach orchard the first thing to be considered is its elevation above the surrounding country.

Good results are obtained in all exposures, but especially towards the northern limit for peach culture a northern slope is preferred. While there are objections to both eastern and western slopes, they are less serious than those against a southern exposure.

The Soil for a Peach Orchard.

The ideal soil for a peach orchard is either a heavy sandy loam or a light clay loam. There are many orchards, however, on land that is quite light and sandy, but while the trees may have a fair growth, they do not bear as well, and the fruit is smaller and inferior in flavor to that grown upon heavier soils. A soil that is rich in humus is desirable fully as much for supplying moisture in dry seasons as for furnishing plant food. When trees are planted upon land where a clover sod was turned under the previous year, they are quite sure to make a good start.

Selection of Trees and Distance of Planting.

A tree of medium size is usually selected by experienced orchardists, as trees more than five feet high and with a diameter of more than one inch are generally less hardy and do not start as well as those of a somewhat smaller size. Those from five-eighths to three-quarters of an inch in diameter and about four feet high are generally selected, although many have good success with whips from two to three feet high.

A few years ago the usual distance for planting was sixteen to eighteen feet each way, but most orchards are now planted twenty feet square. It has been found, however, that at this distance the trees, even though cut back severely, soon crowd above ground, while the struggle for existence between the roots is so severe that the trees suffer both in vigor and productiveness. In several instances the alternate rows of trees have been removed with marked benefit to those remaining, both in the appearance of the trees and in the quantity, size, color and quality of the fruit. By the removal of one-half of the trees the labor of cultivation has been decreased, and with but one-half the number of trees to prune and spray the quantity of the fruit has been increased, while its value has been at least double.

Forming the Head and Pruning the Trees.

When the trees are set, they are cut back to a height of about thirty inches, and if there are several strong buds on the trunk from twenty to thirty inches from the ground, all side shoots are cut off. In the case of large trees all of the buds have generally developed into branches, and in that case all except four are removed, and these are cut back to two buds. If all of the branches are cut away close to the trunks, adventitious buds would have to be depended upon for forming the head, and, as these might start out anywhere along the trunk, the top would not be as symmetrical as when four stubs are left as recommended. During the first season the trees will require little if any pruning, although if a tree is forming a poorly-shaped head a little judicious pruning will often be helpful.

The following spring, as soon as severe freezing weather is over, the trees should be pruned and the head formed. All but three or four of the strongest branches, which are evenly distributed about the trunk at the point where the head is desired, should be cut away, and these should be shortened from fourteen to eighteen inches. If

cut back shorter than this, it will make the centre of the tree too thick. There is a difference of opinion regarding the proper distance from the ground to the first branches, but twenty inches is high enough.

As the trees develop, the pruning given is a combination of heading back and thinning out. The ends of the main branches and the side shoots that have made a growth of fifteen inches or more, are headed back from one-third to two-thirds of the annual growth, and especially during the first two years care is taken to remove all surplus branches that will not be required in forming the framework of the trees. After the trees are five years old, about the only heading back required will be the ends of the main shoots, but the thinning out of the trees should be continued, not only to open up the heads and admit light and air, but it can be made to perform the same function as the laborious and costly removal by hand of surplus fruit, and besides being much cheaper it permits the trees to devote their full vigor to the development of fruit.

Cultivation and Cover Crop.

For the first two years after the orchard is planted the land can be used for the growing of some cultivated crop, but small grains should never be sown in a young orchard of any kind. Melons, tomatoes and other crops that can be planted some distance apart are best for this purpose, but, if care is taken that the hills are not too near the trees, potatoes, corn and other ordinary farm crops can be grown to advantage. If the trees make a good growth during the first two years, it will be well to give up the land to them after that time. In May, before the land begins to bake, it should be plowed or harrowed. An orchard gang plow which will turn furrows two or three inches deep answers very well, or some of the disc or cutaway harrows can be used. Upon an ideal orchard soil there is no occasion for using a turning plow after the trees are two or three years old, and the work can be done fully as well and much cheaper with a harrow if taken at the proper time.

During the months of June and July it is advisable to go over the land with a harrow every week or ten days, or as soon as the soil is dry enough after a heavy rain, so as to prevent the drying out of the surface. About the first of August a cover crop should be sown. While red and crimson clover answer well as cover crops, for the purpose of supplying nitrogen, the ideal crops on other accounts are barley and oats. In ordinary seasons it is an easy matter to secure a catch, and the plants reach a height of fifteen to twenty-four inches before they are killed by frost. In the meantime they have aided the ripening of the trees, and by holding the leaves and snow prevent the alternate freezing and lessen the depth to which the frost penetrates, and thus aid in carrying trees through the winter uninjured which might otherwise be killed. This treatment gives good results after the trees come into bearing, but if the weather is dry during early August, the sowing of the cover crop might be delayed until the middle of August, especially if the trees are carrying a heavy crop of fruit. Oats or barley are better adapted for late sowing than most of the other cover crops. Another advantage in these crops is that they die in winter and act as a mulch in the spring, thus preventing the drying out and baking of the soil. While it is not advisable to delay the working of the land until after the middle of May, a good cover crop of oats will generally keep the land moist until the first of June, while if clover or rye have been sown it is often baked as hard as a brick by the first of May.

Feeding the Trees.

If the soil at the time of planting the trees contains a liberal amount of humus and plant food, the application of manure will not be necessary until the trees begin to bear, but it pays to keep the trees growing, as they can often be brought to a size that permits them to bear a full crop of fruit one or two years sooner if a liberal

supply of food is furnished than if they are grown upon land that is deficient in plant nutriment. While stable manure is valuable because it supplies humus, as well as the elements needed by the trees for their growth, there is danger if applied in too large quantities, as it causes a rank growth of the trees which may be injured by the winter. Ten to twenty tons per acre can generally be used upon bearing orchards with good results, when the soil is deficient in humus and nitrogen, and the danger of injury to the trees will be lessened if it is supplemented with 50 to 100 bushels of unleached wood ashes and 300 to 500 pounds of ground bone or acid phosphate. If the ashes cannot be obtained, from 200 to 300 pounds of muriate of potash can be substituted. The manure can be applied at any time during the winter, and the fertilizers can be used then if there is no danger of washing, or early in the spring.

Fighting Insects and Diseases.

Peach trees are subject to the attack of numerous insects and diseases, some of which are readily controlled, while others are more formidable. In Michigan the diseases known as "yellows" and "little peach" have been quite destructive in some sections, and they have baffled every effort to ascertain their nature. Both are contagious, but it is known that if trees attacked by "yellows" are removed, as soon as the disease appears, its spread can be prevented. The same treatment is being tested for "little peach," but, although it appears to be helpful, it is too soon to speak definitely as to its efficacy.

Borers in the trunks can be held in check by removing the soil to the depth of two inches, and, if any gum and chips appear on the bark at the end of a week, it is taken as an indication of the presence of a borer, and he is dug out with a knife. If the plum curculio is troublesome, the trees are jarred three or four times a week during the latter part of May and early June, and the insects are caught upon sheets spread upon the ground. If very troublesome, it is a good plan to spray the trees with Paris green and lime at the rate of 1 pound of the former and 5 of the latter in 200 gallons of water as soon as the fruit has set. By the addition of Bordeaux mixture, of about one-half the usual strength, the injury from brown rot, scab and other fungous diseases can be greatly lessened, although more can be done by the removal and destruction of all diseased fruit and the working of the land before the fruit has set.

Another very destructive disease, in seasons when the weather in May is cold and wet, is commonly known as "leaf curl." This causes the new leaves to thicken and roll up, and if the attack is a severe one they drop from the trees. This often results in the dropping of the fruit also, and a severe check to the growth of the trees, although it is seldom fatal after the trees are one year old. For this disease a very cheap and effectual remedy has been found. If the trees are sprayed with a solution of sulphate of copper, at the rate of 1 pound in 50 gallons of water, either in March or early April, the disease will be prevented from injuring the trees. Thoroughness and earliness are the only essentials.

Thinning the Fruit.

There is another operation that should not be overlooked if first-class fruit is desired, and that is the removal of the surplus fruit from the trees. This is generally done during the latter half of June and early July, after the dropping of the fruit from the work of curculio, leaf-curl and other causes is over. Just how much fruit should be left upon a tree depends upon a variety of conditions. If the trees are vigorous, well-cultivated and supplied with plant food, they can carry to maturity much more fruit than if neglected and unhealthy. Then, too, the thinning should be much more thorough in years when a large crop is promised than in years when it is a partial failure, as

in years of plenty, small and medium-sized fruit may hardly repay the expense of picking and marketing, while large fruit can be handled at a profit. On the other hand, when there is a short crop, fruit of any size will bring a good price. By the removal of from one-fourth to three-fourths of the fruit, the size of that left upon the trees will often be so increased that there will be nearly if not quite as many bushels as if all of the fruit had been allowed to develop, and, being large, well-colored and of good quality, it may bring three or four times as much per bushel as the unthinned fruit. By the thinning of the fruit the strain upon the vitality of the trees has been lessened, and, while the trees that were not thinned may be so weakened that they will not bear the following year, the trees that were properly thinned may be able to produce a crop of fruit each season. While no definite rule can be given as to the number of fruits that should be left upon a tree, it may be said that as a rule there should be no more than two fruits upon any twig, unless they are more than four inches apart. In the case of large varieties like Elberta, the distance between the fruits can often be increased to six or eight inches with profit, and some growers, in seasons when there is likely to be a glut in the markets, increase the distance to ten inches if the trees have been headed back so that the tops are rather thick. The cost of thinning the fruit is not large, and as, if left upon the trees, it will have to be picked when ripe, many consider that it actually takes less time to pick off half of the fruit when small and drop it upon the ground than to pick all of it carefully when ripe and place it in baskets. Every person who has compared the results secured when the fruit has been thoroughly pruned and the fruit has then been thinned, with those obtained when the trees were left unthinned, will be forced to admit that the only way to grow first-class fruit, in years when the trees have set a full crop, is to thin the trees, using the pruning shears for this purpose in April, and then taking off all surplus specimens in June.

Marketing the Fruit.

A large amount of the Michigan fruit is required to surplus the local demand, but thousands of carloads are shipped to other States each year. Some of this fruit is consigned to commission men in Chicago, Milwaukee and other cities, but a very profitable trade has been built up by some of our best growers who ship on orders from day to day to the grocers in the surrounding States. In this way the profit that otherwise goes to the middleman is saved, and the grocers secure their fruit in a fresh condition. We also have a considerable number of co-operative shipping associations, which not only ship the products of the orchards of their members, but in some cases handle the fruit of other growers. This fruit is delivered to the central packing houses, where it is graded and packed. The plan of selling the crop upon the trees is growing in favor in some sections. Sometimes a lump sum is taken for the fruit, and the purchaser picks and packs the crop, taking all the risk, or the crop may be sold at so much per bushel for the different grades. In this case it is generally picked by the grower, and he may, or may not, grade and pack it, according to the contract.

There are a considerable number of peach growers whose orchards are extensive enough to enable them to accept orders for carload lots, and these men often sell their fruit to wholesale dealers in cities as far away as Boston, Mass. In several counties which have important orchard interests markets for the sale of the crops have been established, and the fruit, after being graded and packed by the grower, is hauled to these markets upon large waggons carrying 80 to 100 bushels and sold. The most important market of this kind is at Grand Rapids, and as it is not uncommon to have fifty or sixty buyers there from all parts of the country, the competition is often an active factor in securing for the grower the highest market price. The railroads and steamboat companies reaching these market points are doing what they can to favor the industry by giving reasonable freight rates and excellent service.

Varieties for Market.

While the varieties grown in Michigan may not all of them be suited to the conditions in Ontario, a short list may be of interest. Although there is a limited demand for fancy white varieties, at good prices, few growers are planting anything except yellow sorts. The leading sorts are St. John, Conklin, Early Crawford, Engle, Elberta, Kalamazoo and New Prolific, Smock and Salway. Hill's Chili and Gold Drop are favorites where extremely hardy sorts are needed. Of the white kinds Lewis and Early Michigan are most grown. They ripen about the middle of August, and are among the best of the early sorts. Triumph is about the first of the yellow kinds, but Admiral Dewey promises to take its place, as it comes nearer to being a freestone and appears to be less subject to brown-rot. Of the new sorts none are more promising than Oceana, which ripens about the middle of September, and seems to be quite hardy and productive. The fruit is of good size, handsome in appearance and of very good quality. It has been quite thoroughly tested and promises to be an excellent market sort.

Object Lessons.

I have somewhat hastily sketched the methods found most valuable by the leading peach-growers in Michigan, and, as the conditions in Southern Ontario are quite similar to those that are found in Michigan, I feel confident that they will be found reliable on this side of "the line." However, as the eyes are more useful than the ears when one wishes to obtain practical information, I trust that those of you who intend to engage in peach growing upon an extensive scale will not fail to take a trip through the Michigan "peach belt," and although we shall be glad to welcome you as visitors and will take pleasure in showing you the orchards, it will suit us even better, if, as a result of your visit, you may conclude to settle among us and thus permit us to practically "annex" you.

Q.: Is the Gold Drop grown with you?

Prof. Taft: It has been largely grown in the past, but, although productive, and where well grown a good variety, too many of our growers do not properly thin the trees, and the result is the fruit is undersized. Where one requires a hardy variety and gives proper attention to thinning the trees, it is a good sort.

The Fitzgerald came into favor five or six years ago and was largely planted, but I do not know of a single satisfactory orchard. It is less productive than Elberta and the Conklin, which take its place.

The Garfield is not being used to any extent, and very few trees are being grown in the nurseries.

Q.: We are growing the Fitzgerald largely, where we cannot grow the Crawford, and it is more attractive in the market.

Prof. Taft: It has not been hardy with us, in fact the fruit buds of this variety are generally injured more than those of any other of the varieties that are commonly grown.

Q.: Are you troubled with the rot?

Prof. Taft: Early kinds frequently rot badly. If you wish a medium early white peach, I would recommend the Early Michigan; it ripens just about the middle of August, just before St. John, and except for the rotting, which in some seasons is serious, it is a very valuable peach. It is a freestone, and a very handsome white peach with a red cheek.

For the last five years from one-third to one-half of the trees put out have been the Elberta, on account of its shipping qualities.

Q.: Do you plant on the north side of a hill or of a grove of trees?

Prof. Taft: The farther north you go the more reason we find for planting on the north side of a hill or grove, as it keeps the buds back, and there is less danger from

frost. From the remarks I have heard, I judge you are looking for good shipping peaches. We feel greatly the need of a good shipping peach that covers a different season from the Elberta. The Engle Mammoth is one of the best, but it is not equal to the Elberta. The Oceana is a Michigan seedling, which ripens just after the Elberta, is about the same size and shape, and is far superior in texture, appearance and flavor. It is yellow, and it is with us almost equal to the Elberta in shipping. The Oceana has been tested freely in Michigan. I have had it in fruit for six or seven years and esteem it very highly. It is handled by N. P. Husted of Lowell, Mich.

Q.: Have you had any experience with the Banner?

Prof. Taft: I have not fruited it to any extent, and I do not like to speak definitely regarding it. It has productiveness, quality and appearance, but the size thus far is against it. If as the trees get older the size of the fruit increases, it will be a very valuable peach. It is a little smaller than the Kalamazoo.

Q.: What soil do you prefer for it?

Prof. Taft: We have it on a sandy loam, and it might do better on other soils.

G. W. Cady: You will not get satisfaction from it till it is about seven years old.

HARDY FRUITS FROM NORTHERN DISTRICTS.

By W. T. Macoun, Central Experimental Farm, Ottawa.

If one had been asked in the early years of the Ontario Fruit Growers' Association to prepare an address on Hardy Fruits for Northern Districts he would probably have considered that about twenty-five miles north of Lake Ontario and the St. Lawrence River would be the extreme limit thought of when the title was suggested. But now it is expected, I believe, that the whole Province should be taken into consideration, reaching as it does, to James Bay in latitude 52 degrees in the north, and to the Province of Manitoba in latitude 50 degrees in the west. When it is remembered that at Leamington we are very little north of latitude 42 degrees, and that commercial orchards of any size are not to be found at the present time much above latitude 45 degrees, it will be seen that there is an immense area between latitude 45 degrees and latitude 52 degrees of nearly 500 miles from south to north, and about 1,000 miles from east to west, which may be included at the present time, as far as the fruit industry is concerned in the northern districts of Ontario. Over this large extent of country there are great differences in climatic conditions, brought about by the wide range of latitude, the large bodies of water which are very numerous in it, the differences in elevation, and the variations in the soil.

At the Central Experimental Farm, which is situated near Ottawa in latitude 45 degrees, experiments in fruit growing have been carried on for the past sixteen years, one of the main objects of which is to determine what could be done in fruit growing in that latitude, and to endeavor to find the best methods of growing fruits where the climate was so severe. There is not time here to review the great number of experiments which have been conducted with varieties, methods of cultivation, spraying, cover crops, cross-breeding and hybridizing, and other matters relating to fruit growing. Suffice it to say that in the sixteen annual reports which have been published there will be found a vast amount of information which has proved extremely useful to the fruit grower in all parts of Canada.

As all the important fruits should be discussed in an address of this kind, I take up each one separately.

Apples.

The apple has a wider range over Ontario than most large fruits, although the plum is still found over a wider area than the apple. Apples have been matured in the Province of Ontario as far north as Fort Frances, in the Rainy River District, and perhaps further, and as they have been produced at Winnipeg, in Manitoba, it is probable that they will be grown in favorable localities right up to the Manitoba boundary. There is also no apparent reason why they should not be produced in favorable localities as far north as James' Bay.

At the Central Experimental Farm, where the temperature occasionally falls to 30 degrees Fahrenheit below zero, we have now between 500 and 600 varieties of apples under test, exclusive of about 2,000 seedlings and cross-bred apples, of which 199 named varieties fruited this year. Out of this large number there are few varieties which kill back at the tips. Why is it, then, that settlers in Muskoka, Parry Sound, and parts of Nipissing, where the conditions are not very different from those at Ottawa, have such difficulty often in getting trees to grow, and sometimes fail altogether? There are two great dangers which fruit growers in the north have to guard against, namely, sunscald and root killing, and two others almost as bad, blight and mice. We have experienced them all at Ottawa, and hence can speak from personal knowledge. I recently wrote to a number of men in Northern Ontario, asking what was the chief cause of failure in growing apples, and in nearly every instance it was the trunk which had gone wrong, and although the fruit grower did not know, in many cases, that it was sunscald, the description of the trouble proved it to be such. Sunscald, as it occurs in the north, is now considered to be due to the thawing and freezing which takes place in the latter part of winter and early spring. The sun shining on the south and south-western sides of the trees thaws out the sap, and a severe frost following at night either causes a separation of the bark from the wood or destroys the cambium. The injury is often so severe that the tree dies the same season, or if it does not, disease sets in, the tree becomes sickly and eventually dies. The trouble can be prevented almost entirely if proper precautions are taken. Some varieties are much more subject to sunscald than others. Where sunscald is bad, special thought should be given to the selection of the site of the orchard and to varieties. Trees should be planted with short trunks, not more than three feet, and less if possible; the less trunk exposed the less injury there will be. When planted trees should be leaned slightly towards the southwest, so that the sun's rays will not fall directly on the trunk the first year or two after the tree is planted. In the autumn the trunk should be protected with a wooden veneer, or even white paper, and an air space should be left between the protector and the tree. This will prevent the thawing and freezing to a very large extent. If these precautions are taken and the proper varieties selected at the outset, there should be little injury from sunscald. Trees usually suffer most from sunscald the first and second year after planting, and it appears to the writer that one reason they do so is that the bark of trees imported from southern nurseries is not at first suited to more northern conditions, and must become hardened or acclimatized. Another reason may be that the tree has not become thoroughly established, and the sap is not yet in the right condition. If a tree has been injured by sunscald it should be headed back and the wound scraped clean, back to living wood, and the injured part painted with lead paint. I have referred to this matter at some length, as I consider protection against sunscald one of the greatest factors in successful apple culture in Northern Ontario.

Root Killing. The winter killing of the roots of apple trees has discouraged many who have tried to grow this fruit commercially in the north, and in the early years before root-killing was as well understood as it is now, trees were killed in this way at the Experimental Farm. It is only occasionally, however, that there is a winter when

root killing is likely to occur, but unless provision is made to prevent it every year, there may be unexpected and disastrous results. It is very discouraging to have trees just coming into full bearing almost destroyed by root killing. Trees are most subject to root killing during a winter with changeable weather, when there are mid-winter thaws with the ground bare and when it freezes to a great depth. Sometimes the soil is thawed to several inches in depth, a sudden change occurs during the day and the temperature may drop to zero or below the following night. This is very trying on the roots of trees, and often apple trees are killed outright, but, as they leaf out and blossom in the spring, the grower is sometimes puzzled to know what has caused the death of his trees. There are several ways in which root killing can be lessened, and if all these are practiced, root killing should be very rare indeed. First of all, trees should be grafted on hardy stocks, and the stocks ordinarily used by nurserymen are not suitable in the north, as their hardiness is very uncertain. At the Central Experimental Farm most of the trees planted in recent years have been grafted on seedlings of Martha, Transcendent, and Dartmouth crabs, and the results so far have been very satisfactory. If a still hardier stock is desired, the wild Siberian crab—*Pyrus baccata*—will furnish it, and this crab has proven perfectly hardy everywhere in Manitoba and the Northwest Territories, where it has been tested, and trees grafted on it at Ottawa are doing well. I trust that our Ontario nurserymen will take pity on the people of Northern Ontario and furnish them with trees on hardy stocks. In districts where apples have been tried and have failed, I would suggest that seed be sown of apples which have been ripened as near that district as they can be had. Experience has taught that seedling apple trees will grow where grafted ones have failed, and I would strongly urge the growing of seedlings in northern districts. Another means by which root killing may be prevented is by the growing of cover crops in the orchard to protect the roots, hold the snow, and prevent the thawing and freezing of the ground. Much work has been done at the Central Experimental Farm in testing various plants for cover crops and in growing them in different ways. A third way in which root killing may be prevented is by mulching the trees with manure, earth, or any other material which will protect the roots from thawing and freezing.

Top Grafting. Some varieties of apples which will not prove satisfactory when grown as standard trees in the north are quite successful when top grafted on hardy and strong growing stocks. Among the best varieties for this purpose are the McMahon White and Haas, and among the extremely hardy varieties the Hibernial and Charlamoff. The Talman Sweet, which is recommended for some districts, is not as hardy as the above.

Mice and Rabbits. Some winters mice are very numerous and do much injury, and in the outlying districts rabbits are also destructive. The depredations of mice can be prevented entirely, and even rabbits can be kept off. The most satisfactory preventive of mice yet tested at Ottawa is the wooden veneer, which is also used to prevent sunscald. Ordinary building paper wrapped around the trunk has also been found perfectly satisfactory, and a mound of beaten snow about the trees has likewise been found effective. Tar paper is not recommended, as sometimes injury results from the use of it, and ordinary building paper is perfectly satisfactory. The mice work along the ground underneath the snow and it is not difficult to turn them. Rabbits can be prevented from injuring trees by protecting them with wire netting; by painting the trunks, and by poisoning.

Blight. The fourth great danger to apple trees in the north is the twig or fire blight. No satisfactory remedy has been found for this disease yet. Varieties of Russian origin are most affected by it. At the Central Experimental Farm some trees have been killed outright, and some so badly injured that it has taken several years before they regained symmetrical proportions. By choosing varieties which are not much

subject to blight, this obstacle to apple growing in the north can to a large extent be obviated.

Site and Soil. The further north one goes the more difficult it is, as a rule, to obtain a suitable site for an orchard, and where there are so many other things to contend with, it is folly to attempt to grow apples in an unsuitable place and in unsuitable soil. The experience of northern fruit growers has been that the most satisfactory results are obtained by planting on a northern slope. It is very important to use every means in our power to prevent sunscald. Trees on a northern or eastern slope get less sun than those on a southern or western, and hence the change in the conditions of the sap is not so great. Buds are slower to develop on a northern or eastern slope and danger from spring frost is hence not so great. The richness of the soil is not nearly as important as the warmth and drainage of it. A warm, sandy loam or a gravelly soil overlying limestone with good natural drainage is an ideal soil for a northern orchard. The results from growing trees in ground with a wet subsoil will not be at all satisfactory, and clay land should be avoided where possible.

Varieties. From our own experience at the Central Experimental farm and from the experience of correspondents in various parts of Northern Ontario, the following varieties of apples are recommended for planting north of latitude 45 degrees :

District 7. North of the Quebec boundary on the Ottawa River, and west to Pembroke; and north through Muskoka, and the southern part of Nipissing, including also Manitoulin and St. Joseph Islands and Parry Sound district, within five or six miles of the Georgian Bay, the following varieties should prove satisfactory :

Summer. Yellow Transparent, Duchess of Oldenburg.

Autumn. Wealthy, Alexander.

Early Winter. McIntosh Red, Fameuse.

Winter. Milwaukee, Scott's Winter, Windsor Chief, American Golden Russet, North Western Greening, Canada Red, and Northern Spy top-grafted. The Salome apple is also doing well in Muskoka, but the fruit has been uneven in size at the Experimental Farm. The Nora and Minto, two Muskoka seedlings, are also highly spoken of. This list of winter apples will need revision almost every year until some really first-class hardy dessert apples are found, as new and better varieties are constantly being brought to the front. The Windsor Chief is the most promising new hardy winter apple, being a variety of fine appearance and good quality, and a good bearer.

District No. 13. This includes all of Ontario north and west of District 7. Only the very hardiest varieties are recommended in this list.

Summer. Yellow Transparent, Blushed Colville, Charlamoff, and Duchess of Oldenburg, the two latter being autumn varieties in this district. The first variety is not as hardy as the latter, and if only two are planted I would recommend the Charlamoff and Duchess.

Autumn. Longfield, Hibernial, Patten's Greening, Peerless, Autonovka and Wealthy apples and Whitney, Martha and Transcendent crabs. Also in the coldest parts the hybrids between the Siberian crab and apple originated at the Central Experimental Farm.

It is a surprise to those who come from the more favored fruit districts of Ontario to find how well the trees bear in the north and what fine fruit is produced. Trees which are unshapely, sometimes without a real trunk, and growing more like bushes than trees, will be simply loaded down with fruit, and these trees bear earlier than they do further south, being more or less stunted in their growth by the severity of the climate. It may be interesting to know just how much trees of a few varieties have produced in one season at the Experimental Farm at Ottawa.

Yield From One Tree in 1902.

Varieties.	Number of years ^s planted.	Yield.
Duchess of Oldenburg	14	94½ gallons, or about 4 barrels.
Wealthy	14	85 " " 3½ "
McMahon White	14	147 " " 6 "
Patten's Greening	10	71 " " 3 "
Longfield	14	83½ " " 3½ "
Hibernal	12	82 " " 3½ "
Charlamoff	14	102½ " " 4¾ "
McIntosh Red*	12	71½ " " 3 "

*The same trees of McIntosh Red yielded 94 gallons, or nearly 4 barrels, in 1903. Wealthy trees have yielded over a barrel of fruit six years after planting. A correspondent in the Rainy River district, 190 miles west of Port Arthur, writes that an apple tree, probably Duchess, yielded eight bushels of apples six years after planting.

For further particulars regarding apple culture in the north, see Bulletin No. 37 of the Central Experimental Farm series.

Plums.

The next important large fruit to the apple in the northern districts of Ontario is the plum. This fruit is found wild in almost every part of the Province, and is valued very highly by the people in some districts.

North of latitude 45 degrees the European is, as a rule, very unsatisfactory, unless grown near large bodies of water, which keep the air moist, as St. Joseph's and Manitoulin Islands, for instance, where they appear to succeed fairly well. It is not the number of degrees of cold which makes it difficult to grow these plums, but the dry, cold atmosphere inland has the effect of drying out the buds, and they appear to be killed in this way. Seedlings have, however, been originated in Ontario and Quebec, which are hardier in fruit bud than the standard kinds, and the time may come when some varieties will be available which will bear almost every year. Among some of these hardy seedlings may be mentioned the Raynes and Mount Royal, two Montreal plums, which seem hardier than most others. Among the hardiest of the standard European kinds are the Richland, Lombard, Gueli, Arctic, Montmorency and Quackenbos or Glass Seedling, which would be worth testing anywhere between latitudes 45 degrees and 47 degrees near large bodies of water.

At present the great dependence in the north must be on the native plums and the improved varieties of wild plum of the northwestern States, of which there are now more than 200 named varieties, which, with the varieties of the native plum, give a ripening season from the 1st of August to early in October, or more than two months; quite as long as the season of the European plum.

Although the quality of these varieties is not equal to the European, the best of them are quite good, and when eaten out of hand some people like them better. When canned or preserved, however, they are not as good, although there is a great difference in varieties. By removing the skin when preserving, the quality of the preserves is very much improved. Of the varieties which can be obtained from nurserymen, the following are the best, in order of ripening: Aitkin, Odegard, Bixby, Mankato, Cheney, Hawkeye, Stoddard. The last two would probably be too late where early autumn frosts occur. It is probable that earlier local seedlings may be found, and the best of these should be transplanted to the orchard. The Compass cherry, which is a hybrid between the wild plum and the sand cherry, is a low-growing bush, which yields good crops of fruit of fair quality.

Plum trees, like apple trees, should be planted in well drained soil, and, if possible, on a northern slope, as spring frosts often injure the blossoms. They require less care than apple trees, and when once established usually do well. The blight of the native plum is the worst enemy to this fruit in Northwestern Ontario. This destroys the fruit when it is about three-fourths grown, causing the plums to wither and drop. Thorough spraying will prevent this. In Bulletin No. 43, on Plum Culture., by the writer, special attention has been given to the American native plums, as there is such an immense tract of country where only these can be grown.

Pears.

Pears are not satisfactory north of latitude 45 degrees in Ontario. In a few places they can be grown, but the number of pear trees now living is very small. Blight and winter killing both destroy these trees. Many of the standard varieties have been tested at Ottawa, and among these the Flemish Beauty has been found to be the hardiest and least subject to blight. Fine Flemish Beauty pears are grown along the Ottawa River between Ottawa and Montreal, and they can be grown in some localities in Ontario north of latitude 45 degrees. The Longworth pear, though not of good quality, is less subject to blight than many others and is hardy at Ottawa. The Russian pears are quite unsatisfactory, as they blight badly, and are of indifferent quality and decay rapidly.

Peaches.

Peaches have been produced in the open air at Orillia, but this can hardly be considered a northern district. It is possible, however, that the northern limit of the peach will not stop at Orillia.

Cherries.

Cherries, like European plums, are not satisfactory north of latitude 45 degrees unless grown near a large body of water, as the buds dry out in winter and do not open. Spring frosts often complete the destruction of the fruit buds if the winter leaves some untouched. We have not had a full crop of cherries at Ottawa since 1898, while down the St. Lawrence River, 70 miles below the City of Quebec, where the temperature falls as low in winter as it does at Ottawa, there is a regular crop of cherries. The moist air from the river preserves the buds. The hardiest cherries in the flower bud tested at Ottawa are : Ore! 25, Vladimir, and Minnesota Ostheim. Also a dwarf cherry called Koslov Morello, which is protected by the snow in winter. We are working to obtain a satisfactory dwarf cherry for the north, as we believe this to be the solution of growing cherries successfully inland.

Grapes.

More grapes should be grown in northern districts than there are at present, especially between latitude 45 degrees and 47 degrees. At Ottawa 101 varieties ripened thoroughly this year, and even in the worst years we can depend upon ten or twelve varieties at last. Among the varieties which are almost certain to ripen unless injured by spring frost are : Moore's Early, Campbell's Early, Moyer, Canada, Brant and Peabody. The Champion, which is earlier than any of those mentioned, might be included, but the quality is so inferior that I hesitate to recommend it. A new variety, the Manito, is very promising as an extra early grape of good quality.

To grow grapes successfully in the north, they should be planted in high, warm, well drained, light soil, and on a southern slope, where they will get all the heat possible. The vines should be grown on a wire trellis so that the canes may be spread in such a way as to admit sunlight and air to the fruit. As the vines have to be covered

with soil in winter, it is necessary to adopt a system of pruning, which will make this labor as light as possible. A vine with two arms, and having the crown near the ground, has been found the most satisfactory method thus far. These arms are removed and replaced by new ones occasionally. The arms should be spread out within eighteen inches of the ground, and the crop of fruit should not be more than two feet from the ground. By growing the vines in this way, the fruit will get the reflected heat from the ground and will ripen better. Some parts of Northern Ontario are very rocky. Growing among and over rocks, grapes should ripen even better than when grown as already described, as the heat would be greater, and good soil is not necessary to grape growing.

Vines should be left covered as late in the spring as possible without danger of rotting, as grapes are very susceptible to the spring frosts.

Raspberries.

Raspberries grow wild so abundantly all through the northern districts that settlers are not quick to try the cultivated kinds. Among the hardiest varieties may be mentioned Marlboro, Turner, Clarke, Herbert, Sarah, Loudon and Dr. Reider, the last named variety having been found among the hardiest in Manitoba and the Northwest. Where the canes are injured by winter, they should be bent over and held down with earth, so that the snow will cover them, thus protecting the canes from being winter killed. The hardiest Blackcaps are : Older and Hilborn, and of Blackberries : Agawam and Snyder.

Currants.

Currants succeed admirably in the north, and there should be no trouble in growing this fruit. The Wilder, Pomona, and Cherry, are three of the best all-around varieties, but for eating out of hand there is nothing superior to the Moore's Ruby, as it is not as acid as the others.

Gooseberries.

The gooseberry is also a hardy fruit, and, being a lower grower, is covered with snow, which makes the chances for a good crop still better. Of American varieties, Downing and Pearl are the most satisfactory, though the Whitesmith, Industry and other European kinds succeed well under some conditions.

Strawberries.

There should be no difficulty in getting the best cultivated varieties of strawberries all through the northern districts, with the exception of those parts where late spring frosts occur, when it will be more difficult to procure a crop, but by judicious management the plants can be protected from such frosts. At Ottawa the following varieties are among the most satisfactory : Bubach, Buster, Lovett, Glen Mary, Greenville, Beder Wood, Sample, and Warfield. During last spring there was a good opportunity of learning which were hardiest in the flower, as frosts occurred during the latter part of May which lessened the crop very much, and destroyed practically every blossom of some varieties. From our experience, we would recommend : Beder Wood, Warfield, Lovett, Sample, Buster, Williams, and Crescent as being among those most likely to suffer least from spring frosts. The Crescent appears to be about the most hardy.

Strawberries should always be lightly mulched with straw in the autumn, and even if there is abundant snow in winter, the plants, unless covered, may start to grow early in the spring and then suffer from frost. The mulch should be left on as late in the spring as possible without injury to the plants, as the longer they can be kept dormant the better chances of success there will be. Only a light mulch is necessary.

a heavy one may smother the plants and prove worse than none. One correspondent says that he gets best results by growing his plants in sod like wild berries. The grass in his case acts as a mulch.

Owing to the heavy snowfall in the north, there is no doubt that many things will be grown there which will surprise us. One great drawback at present is the spring frosts, but as the country opens up these will probably occur less frequently, and, furthermore, methods will be devised for protecting plants against them.

In the past, fruit culture has advanced northward with civilization, and it is likely to do so in the future. Severe climatic conditions will, however, have to be met, understood, and conquered before success is assured, and this takes time. The fruit growers of the north will be greater thinkers than those of the south, as greater difficulties will have to be overcome, special methods of culture adopted and new varieties produced which will suit the new climatic conditions.

In the north, the best wheat is produced, and the best honey, cheese, and butter, and when the same high standard of quality is demanded for fruit as for these articles, the men of the north will be able to furnish their share of fruit of the highest color and finest quality.

DISCUSSION.

Dr. W. Saunders, Director, Central Experimental Farm, Ottawa.

You who live in this favored section of the country can form little idea of the difficulties that surround the growing of fruit in the northern districts. Districts such as Leamington and Niagara, while highly important in themselves, are small in comparison to the vast extent of country to the north and west, to people which, earnest efforts are being made. We cannot all live in these favored spots, and hence should be willing to do what we can to help those who are less favored. To show you to what an extent the extreme north sections of the country are unacquainted with fruit, I was once traveling in the north with a member of the Geographical Survey, who had brought down a boy from the Hudson Bay Territory. When they approached civilization, they came to a turnip field, and my friend informed the boy that turnips were a nice kind of fruit. The boy gathered one and ate it, thinking it was one of the finest things he had ever tasted. On another occasion I met a family at Edmonton, who had come from the Mackenzie River, near Fort Peel. None of the children had ever seen an apple. I bought a few and handed them to them. They looked at the apples, but did not know what to do with them. Finally the youngest put his teeth in one of the specimens, and found it exceedingly good and began to eat it, the rest following suit. We have, coming into this country, thousands of persons who have little acquaintance with the fruits grown here. We want to educate these people to use fruit. We had last year between thirty and forty thousand people land in Canada from the northern countries of Europe, Galicians, Icelanders, Swedes and Norwegians, and a large proportion of whom known very little about fruit. One of the best ways to create in these people a taste for fruit is to place in their hands fruit trees of such varieties as they can grow for themselves. The more fruit a family consumes the more it wants. With this in view, early in the history of the experimental farms, earnest efforts were made to secure varieties hardy enough to be grown in Manitoba and the Northwest Territories. Every variety that promised to be hardy was tested at Brandon and Indian Head. This testing has been going on for sixteen years, but, although hundreds of varieties have been tried there, we have not yet grown an apple on either of these farms, until last year when we had a few Transcendent crabs. In 1886 we secured samples of the wild Siberian crab, with the expectation of having it as an ornamental shrub. Finding that it was perfectly hardy and gave crops of fruit every year in considerable quantities, the idea occurred to cross it with some of our best and hardiest sorts of apples and raise seedlings from these crosses and

test them in that country. This work has been going on for eight or nine years. Two years ago I brought to this Association some of the results of this work and exhibited specimens of the fruit that had been obtained. The total number of crosses to date is about 800, of which about 150 have fruited. A large proportion of these are comparatively worthless, but in one case perhaps out of ten we get a fruit large enough and good enough to warrant its propagation for further test in the Northwest. These varieties, although grown in Ottawa, have been tested at Indian Head and Brandon and found perfectly hardy. Last year young trees of the best sorts were sent to points in the Northwest for co-operative tests, the places selected being arranged so as to cover the widest differences in altitude. As the farm at Indian Head is only 2,000 feet above sea level, it remains to be seen whether these fruits will be found hardy at higher altitudes. It is expected that they will, because the female plant has been found hardy throughout all the settled parts of the Northwest.

We have had several excellent sorts added to the list which have fruited since I last spoke on this subject. This year we had two new varieties which fruited for the first time. These are larger and better than anything we have hitherto had. The best sorts are being propagated, and will be distributed as far as possible, and I hope we shall be able to get some of our leading nurserymen sufficiently interested to propagate and distribute them, as this is a work rather belonging to them than to the Experimental Farms.

In this way we hope to help the fruit growers of Ontario and the fruit growers living in other parts of the Dominion, by awakening a love for fruit among the large number of persons now settling in the Northwest, thus creating a demand for the better varieties which you will be able to send them.

We are carrying on experimental work with other fruits, but none are so important as the cross-bred apples, which are being produced for the North-West. I believe that in another ten years we shall be able to furnish fruits of such hardiness and quality as will permit of the growing of apples all through Northern Ontario up to James' Bay, and through Manitoba, Assiniboia, Alberta, and Saskatchewan. Whether we shall be able to carry them still further north remains to be seen. The outlook is very hopeful; the people who have come from fruit-growing countries are very anxious to get these fruits, so that they may be able to grow for themselves some part of the fruit they want to consume; but they will still be large customers for the better fruits of the east.

POWER SPRAYING.

By W. A. Mackinnon, Chief Fruit Division, Ottawa.

It should be clearly understood that at the present stage of horticultural development, the question no longer is whether spraying pays; spraying is admittedly essential if we are to have clean crops, and what we have now to consider is how best to accomplish the operation. Supposing that with all the advertising and discussion of past years, the public had become acquainted with the proper methods of spraying, that every farmer who had a small orchard understood properly how to spray—even supposing that state of affairs—difficulties would still remain. The farmer who has only a small orchard feels that it is rather too much to ask him to purchase a spraying outfit, or if he has an outfit, he often finds when he should use it that he is very busy, and puts it off. Many who have learned to believe in the operation and have purchased outfits do not use them properly, either because they do not use them at the right time, or because they hand them over to men who care nothing about the details of the operation—who do not know that accuracy counts for everything, and that thoroughness is the only road to success. In such cases there are no results, and it is worse than if



THE YEARLY FIGHT FOR THE FRUIT CROP.

Now that spraying has come to be generally recognized as a necessity in successful fruit growing, the question what sprayer to buy is a serious one for many growers. The illustration shows a Power Sprayer at work in a peach orchard. This sprayer is highly spoken of by many growers. It is comparatively cheap, secures its power from the rear wheel, does not have to be recharged, requires no fuel, is not too heavy, and is reliable and not expensive to operate.

they had not sprayed at all, because the operation is discredited. These are some of the difficulties that occur in connection with ordinary spraying.

Considering and accepting the fact that mere education to induce spraying was a thing of the past, the Minister of Agriculture last spring authorized the Fruit Division to conduct a demonstration in power spraying, in order that the growers might

see that by that method they can spray more efficiently and economically than by the old method, especially when labor is dear. In order to test the method, gasoline power outfits were sent to Woodstock and to Montreal. The spraying was not to be a mere demonstration of the use of the power pump, but a scientific experiment, continued throughout the season. The orchards were to be sprayed at least four times, and the farmers interested agreed to pay for the operation, the amount being fixed in advance.

In the case of Montreal, it happened that this year they had no fungous disease or Codling moth, and, therefore, we have nothing to show as the result of our work there. The greatest number of trees covered in one day was 800, the trees being of medium size and the soil not such as would facilitate quick work.

In the neighborhood of Woodstock some twenty orchards were accepted. These extended in a long, irregular line from Ingersoll to Woodstock, the total distance being about ten miles from end to end, and the route was, therefore, not best adapted to economic operation. The orchards were of all sizes and descriptions, so that the work was done under all sorts of conditions. The spraying outfit consisted of a two-and-a-half horsepower gasoline engine, two lines of hose with six nozzles each, and a tank containing 250 gallons. We used 1-4-inch hose for lightness. The size commonly used is half-inch; three-eighths or a quarter is much better; it is about eight times lighter when filled with liquid than half-inch. We used a wide-tired wagon, with low wheels in front to facilitate turning.

Altogether we had 8,790 "tree sprayings," and the average cost per tree for each spraying was rather over four cents. We had a most unsuitable route to follow, and had no thought from the first that we could make it an economic success. Then, our men were quite inexperienced with gasoline outfits, and time was lost and expense incurred, which will not be necessary another year.

Q.: Is that all in the four cents?

Mr. Mackinnon: Yes. I am not at all sure that I can say that power spraying will always be done at four cents. Some of the spray-pump catalogues will lead one to suppose that a fraction over two cents would do the work with hand power. I think this is very doubtful, and I should not care to promise that spraying will be done on an average at less than five cents for each application.

Q.: Are you referring to mature apple trees?

Mr. Mackinnon: Yes; peaches, plums and pears would take less time and material. You get a very fine spray with a power outfit. The spray is produced by 100 pounds of pressure constantly on the hose, and is, in fact, a mist, which will cover every part of the tree.

As regards results, I may say that in the sprayed orchards we had very great difficulty in finding scab or defective fruit. We had some remarkable examples of the way spraying benefited the crop. On one side of the road, in an orchard we sprayed, it was difficult to find defective fruit; on the other side of the road, where the orchard had not been sprayed, it was difficult to find clean, perfect fruit. In the orchard of Mr. Schell, Woodstock, which we sprayed, the results were very marked. Close to this orchard in a kitchen garden was a solitary tree, which could not be approached by the outfit owing to its location. The fruit from that tree was scabby and small, and lacked color. We cannot attribute all that to lack of spraying, but the operation undoubtedly prevented scab on the neighboring trees. In another instance the tree was situated very close to the house, so that one side of it was sprayed and the other untouched. The difference in the quality of the fruit on the opposite sides of the tree was most remarkable.

Mr. Schell has given me a letter containing his opinion on the results of the operation, which reads as follows:

Extract from letter from M. & W. Schell, Woodstock, Ont.:

"(1) When the one outfit is used for a number of orchards we would favor the use of a gasoline engine. We do not think the work is any more efficiently done than

could be done by hand. It is simply a matter of economy in the saving of labor. To do a reasonably-sized orchard we would consider two men necessary on the pump to make proper headway and to keep up sufficient force.

"(2) My own crop of apples was certainly as clean as anyone could reasonably wish. It was necessary in most cases to look to find spotted apples. The Northern Spies, which are usually liable to spot, were exceptionally clean and bright, and far superior to anything in the neighborhood that was unsprayed.

"(3) I have no doubt it paid to have spraying done. It is almost sure death to the Codling moth."

Q.: How many times do you consider it necessary to spray?

Mr. Mackinnon: That will depend on the season. If you had cold and wet weather, the spraying should be continued frequently, as under such conditions the scab is late in developing. Four sprayings should be plenty in ordinary seasons.

Q.: At what dates?

Mr. Mackinnon: Before the buds open, just before the blossoms open, shortly after they fall, and ten days or two weeks later.

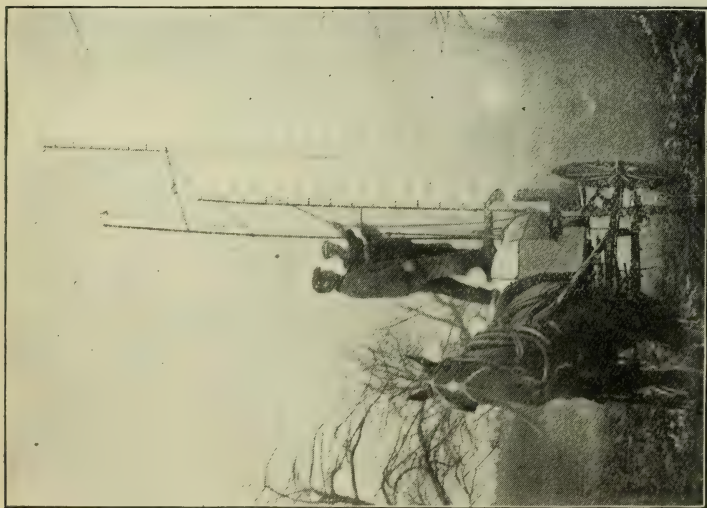
My object in addressing you is not merely to lay before you the results of some of the work of the Fruit Division, but it is chiefly with the hope that you will do something yourselves towards encouraging the use of power spraying. We all know that people who belong to Horticultural Societies do attend to these things fairly well, but there is a vast army of farmers who have small orchards, and it is from those orchards that a large quantity of our export fruit comes. My thought is that the members of this Association should become missionaries, and induce these small owners to spray their orchards so that they will be able to market clean fruit. We shall never glut the market with good fruit, but the trouble is that we put upon the market along with our good fruit large quantities of inferior stuff. If the spraying operation is performed five times and costs five cents per tree, you have invested twenty-five cents in each tree. If the trees are fully grown, what is a fair average crop? Suppose it is only one barrel, can you make 25 cents by having that fruit clean? What is the difference between No. 1 fruit and inferior fruit in the market? Fifty cents, seventy-five cents, or a dollar. Will the members or directors of this Association constitute themselves missionaries or supervisors of their less well-informed brethren, each in his own district, and urge the adoption of methods that will lead to the production of clean fruit? Induce the farmers to unite to purchase power outfits, which cost about \$350, including the wagon, and to employ one man to each outfit who understands or will study the proper methods of spraying—who will know how to mix and properly apply the compounds, so that instead of each farmer having to face the problem of getting a skilled man or throwing his money away by doing the work improperly, one skilled man will act for a group of them. I hope the Association will adopt this suggestion in some form. We have got past the day when we have to instruct our growers what varieties to plant. We know what to grow and how to grow it, and what we require is to get rid of the culls, which are eating up our profits, and then to place our fruit on the market in an attractive form.

Mr. Barber: This is a question that has interested me for a number of years. My trees are coming more and more into bearing. I have a good hand-power sprayer; shall I continue with it for a year or two, with the prospect that at the end of that time the power method will be more perfect than at present?

Mr. Mackinnon: I cannot say we have arrived at perfection in power spraying, but it is not new on the other side of the line. No doubt, improvements will be made from time to time. My opinion is that it would pay you to dispose of the hand-power and substitute a power sprayer, if you have the requisite number of trees.

Mr. Barber: I have about three thousand trees.

Mr. MacKinnon: I would think that would keep an outfit busy.



COMPRESSED AIR SPRAYER AT WORK. NO. 2.

A large orchard can be effectively sprayed in a short time by one of these sprayers equipped with a spar as shown. This spar is adjustable and can be moved when desired, until the upper part is entirely above the lower, thus not duplicating the spray. The gasoline engine, used to load the tanks, is usually kept at the nearest point to the orchard where a good supply of water can be obtained.



COMPRESSED AIR SPRAYER BEING LOADED. NO. 1.

The illustration shows a gasoline engine compressing the air into one of two tanks on the wagon and filling the second tank with the mixture to be used. The tanks contain about 100 gallons each, and it takes 10 to 15 minutes to fill them. The air tanks are charged up to 160 to 180 pounds pressure to the inch. When this compressed air is turned into the tank containing the mixture the liquid is forced out in the form of a fine spray.

Mr. Owen, Catawba Island, Ohio : Early last spring I introduced a compressed air outfit, and to me it has solved the problem of spraying to a great extent, and has taken the bugaboo away from it. Such an outfit consists only of an air compressor and two tanks for the waggon and a storage air tank. The outfit is very simple. You go into the orchard with two tanks on the wagon, and no expensive, bulky machinery to get out of order. One man does all the work. I operate a cluster nozzle and spraying spar. They are operated from a platform at the back of the wagon, where the operator stands. The tank holds 130 gallons. My remarks apply particularly to the spraying of peach trees. A peach tree of the ordinary size can be sprayed thoroughly from one side with a strong wind with about three passes at it with a cluster nozzle. To do away with some of the labor, I got up a spray spar with twelve nozzles distributed at intervals up the spar. I use a Niagara nozzle with a flat spray, and thus obtain with this apparatus a solid bank of spray. In this way we are able to spray as rapidly as the horse can walk, and with a strong wind one man can spray twenty acres of peaches per day without difficulty with a single rig. With me it was a question of labor, and I had to get something to help me to do the work, from the fact that we have to pay twenty cents per hour for a good practical sprayer, and it came to a point this spring when we could scarcely get them at any price. This system has proved so successful that seven or eight central stations have started up. These co-operative associations are getting the plants and doing the spraying for their members. You need only one man at the pumping station ; he pumps up the compressor and does the mixing ; and one man in the orchard who will keep three rigs going and spray out a wonderful lot of mixture. He will do more than twelve men, or four rigs which employ three men each, and do better work. The spraying spar will not miss one small twig, and will not waste the material, while with the individual nozzle you often go over the same limbs two or three times.

Q. : How far do the nozzles extend from the spar ?

Mr. Owen : They are right on the spar.

Q. : What is the cost ?

Mr. Owen : I have had to fight the San Jose Scale, using the lime, sulphur and salt solution. For that I have used a steam boiler and engine rather than gasoline. You can run the air compressor with a gasoline engine. I have a steam boiler and air compressor, and can keep as many rigs going as we want ; I should recommend three rigs for large commercial orchards. Many of our people are taking up spraying as a business. With the lime, sulphur and salt mixture they charge about three cents a gallon made and applied. The outlay for such a plant, including steam boiler, rigs and all, would probably be from \$600 to \$800. My plant has cost me a little over a thousand dollars, but I went to a lot of expense in experimenting which you could probably avoid.

INSECTS AND FUNGOUS DISEASES OF 1903.

By Dr. James Fletcher, Ottawa.

The subject of my address to-night, ladies and gentlemen, and boys and girls, is the insect and fungous diseases which every year cost this country a great deal of money. Of every crop that grows the farmer loses, every year, nearly one-fifth of the profit, from causes which can be largely prevented, but which are not to the extent they ought to be. This year has been a particular exception to this rule. It is not advisable to-night to go into any great detail, but I must speak in rather a general way. The losses during the past year to the fruit grower were chiefly due to old and well-known pests, which, unfortunately for them, many of our fruit growers think they know all about. The most important of these was the San Jose Scale. Do not let any Ontario farmer allow the wool to be pulled over his eyes by the statement, too

frequently made, that "we can manage that all right." Do not believe that you have any cause to feel that you can deal with the San Jose Scale without a great deal of trouble. From all we know, and we know more than we ever did before, the San Jose Scale is a scourge that is robbing Ontario of many thousands of dollars every year. Within the last week I saw the statement that half the fruit trees in the United States would eventually be destroyed by the scale. Let us ask, then, have we a remedy? I answer decidedly, yes. We have a good, practical remedy, if farmers will only use it.

We began a discussion this afternoon as to the way to spray, and as to whether it paid to spray or not. There is not a successful fruit grower in this Association but knows that it does pay, and pays enormously, and makes exactly the difference between profit and loss in the Ontario orchards. It is worth the while of the members of this Association, and every one dependent on this industry in which such enormous sums are invested, to know that the San Jose Scale can be controlled if people do what they know they ought to do for their own sakes. Should the fruit grower not spray when he knows that he will lose money by not doing so? Should he be so foolish as to say he has not time to do it? Is there any man in business who will say that he has not time to make money? That is exactly a parallel case with a fruit grower, when he can prove to himself that he can save money if he does this and all other parts of his work in the best way. But all will see that the man who will plant an orchard and cultivate it and prune it for years is not a good business man if he neglects two or three days' work in the spring spraying at the crucial time which determines whether his labor is to return him any profit or not for that year at least. We discussed today whether it was four or five cents per tree that the cost of the treatment came to. That should not have been the discussion, for even if it costs fifty cents per tree, we could make one hundred and fifty per cent. by the investment.

Dr. Mills, in his address last evening, drew your attention to four or five matters that were of great importance to fruit growers, and among them he pointed out the importance of the work of spraying being thoroughly done. Most people who spray do not spray at all. What is a spray? It is mist—liquid broken into such minute particles that it falls as an actual spray or mist, and yet the farmer who is going to spray, in many instances gets the cheapest pump that will throw liquid in any sort of way on to his trees, and then expects to get the best results. He must get the best implements in the market, and get the best men, or see to it himself that it is properly done. It must be done well and thoroughly, so that the whole tree is covered. Then, spraying is not a general panacea which will cure all ills. There are different kinds of pests and different kinds of materials to be used, and these must be understood by the fruit grower before he can get the best results. We have different kinds of fungi, those that work from the inside and those that work from the outside, and different remedies are necessary for each. Some insects eat up the substance of the foliage, and require special remedies; others suck up the sap, and the tree may be said to die for want of its blood. All must be treated in their own special way. Fortunately for the farmers there are many general remedies that may be used for several of these pests at the same time.

In speaking of the San Jose Scale, I will say that the one remedy that up to the present has, on the whole, given the best results is the lime and sulphur wash. This is the most practical remedy to use for the reason that it not only destroys the San Jose Scale and many kinds of insects, but at the same time many kinds of fungous diseases as well. It is rather troublesome to make, but with improved machinery and the knowledge which has been distributed all through the Province by the officials of both Governments, the men most concerned are learning more and more every day about this work. A recent discovery has been made that the long and tedious operation of boiling this mixture for two or three hours to dissolve the sulphur has been obviated by the use of caustic soda when making the wash. For a few minutes let me refer to that great advance in education which has recently come so much to the front, namely, what is known as "nature study." Nature study is the training of boys and

girls to be useful men and women—good citizens—by teaching them to use their eyes and their minds at the same time—to look at a thing and to see it when they are looking at it ; teaching them not about natural history, but to see that things differ from one another ; to sharpen up their eyes and their minds so that they can think for themselves about every problem that comes before them in their ordinary lives ; teaching boys and girls to be wide awake, and therefore to be more useful men and women. The object of nature study is not to train scientists, but to lay the foundation for making good, strong men and women, whether they are to be parsons, lawyers, doctors, farmers, or merchants, all who engage in the ordinary vocations of life. The boys and girls of to-day have a better chance than their fathers and mothers had to be useful Canadians. With these increased opportunities they must not forget that they have greater responsibilities. You as fruit growers who attend this convention have something demanded of you. You were appealed to by Mr. Pattullo, as a body, to seek to improve your own gardens, and by that means to exemplify to the city or the surrounding country where you live what may be done by each one to help to improve and beautify the whole district where he lives. In your work as fruit growers you know, every one of you, that you ought to spray your trees regularly if you hope to control the regular insect and fungous enemies, so as to get the fullest returns for your work. You are sometimes very busy at the time this ought to be done, and it is difficult. Of course it is ; most things that are worth doing are troublesome. That is not the chief consideration. What we have to decide is, Does it pay ? In reply to this I say very emphatically, Yes, it does, and most abundantly !

I saw in *The Globe* yesterday an account of the crops of Ontario for the past season. It was stated that there was an average for the Province of two barrels of apples to the tree. You as fruit growers know that that is not at all a large estimate. Let us put it down that the grower this year makes a profit of one dollar on each barrel. Suppose he spends fifty cents in protecting every tree from insect and disease, he would still have \$1.50 profit ; but if, on the other hand, he does not spray, we know that there is in most instances nothing at all. Let me tell you that a few years ago the orchards at the Experimental Farm containing all the leading varieties, including many which are subject to disease, as McIntosh and Fameuse apples, many of these were infested with black spot and oyster-shell bark louse, but by persistent spraying in the proper way, the horticulturist, Mr. Macoun, has brought that orchard to the condition that I do not believe there were a dozen spotted apples in that orchard this year. I did not actually see one. Those trees are now also practically clean of the oyster-shell bark louse. Now, why is this the case ? Because the nature of that pest was studied and understood, and the proper remedies were applied accordingly. A few words on another burning subject.

What is the condition of Ontario to-day in regard to the San Jose Scale ? It is worse than it was this day last year, because the special spraying for this pest has not been done vigorously enough. Providentially this scourge has not spread very far through the Province, but in the infested area and in individual orchards the scale is spreading very rapidly, and it is to-day a menace of great magnitude to our orchards. There is a practical remedy, and it behoves the fruit growers to apply it. I would advise you to pin your faith to one remedy which you know is good, until you find a better. That remedy is the lime, sulphur and salt wash. Systematic and regular work every year, even in orchards that are badly infested, will bring down the infestation so that your trees will continue to grow in a thrifty manner and to yield crops of fruit. But you must not stop for a single season, or your enemy will increase very rapidly.

That is not the only pest ; the oyster-shell bark louse, which is a pest on apple trees in every part of Canada, may be cleaned off by the same wash. This insect can also be easily treated by spraying early in the winter with a simple lime wash, one pound of fresh lime in each gallon of water. Common sense will help us in all these operations. For instance, in using this wash it is easier and more effective to apply two

thin washes, the second to be put on after the first is dry, than to apply one thick wash.

The Scurfy Bark Louse can also be treated on apples with the lime, sulphur and salt wash, and it is almost, if not quite, as good a remedy for the black spot of the apple as the Bordeaux mixture.

The Cherry Aphis has given a great deal of trouble in this district. This is a representative of the class known as the black plant lice. There are black colored plant lice, and also green ones. The practical difference to the fruit grower is this, that they must use a stronger remedy for the black than for the green lice. For the green lice use one pound of whale oil soap in six gallons of water, and for the black the same quantity of soap in four gallons of water. Many plant lice have the habit of living on two different kinds of trees at different seasons. The hop aphis, for example, lives only on the hop plant while that is above the ground. This plant develops only late in the season. What are the insects to do in the first and latter part of the year? It has been discovered that their habit of life is not to lay their eggs on the hop at all, but on plum trees. Therefore, one good remedy is to spray plum trees near hop fields to destroy the eggs of the Hop Aphis.

Similarly, the apple aphis in the hot summer weather leaves the apple tree and flies to the grass. Although they are not seen on the apple tree at that season, they have not all died, as some might think; they have simply gone to other plants, and later in the season they will swarm back to the apple trees and lay their eggs there. The practical point for the fruit grower is to know that the eggs may be destroyed by spraying with whale oil soap or kerosene emulsion.

I do not suppose there is any country in the world where such complete spraying experiments have been paid for by the Government as in your own Province; but the time has come when you must take the matter into your own hands, realizing that much has been done for you, and that, therefore, much is required of you.

I think that perhaps the fruit growers of Ontario may have had a little too much done for them; they have not been thrown on their own resources enough. The man who has done his own work knows what he has done and why he has done it.

There are a great many kinds of injurious insects that may attack your crops, yet the amount of knowledge you must have in order to combat them is very small—merely some general knowledge of the nature of insect pests. The first enquiry a farmer should make when he finds that his crops are not succeeding is, What is the nature of the injury? Then, if he can determine what sort of insect is at work, he will be able to apply a general remedy until he gets definite information from some one else who has had more experience. Definite knowledge must come from a definite knowledge of the habits of an insect. One of the commonest mistakes made is to suppose that Paris green will destroy everything. I get hundreds of letters every year saying, "I send you a certain insect; have applied Paris green, but it does not seem to do much good." In nearly every instance I find that the insect is a plant louse or a similar insect, for which Paris green would not have the slightest effect. Paris green is not a general remedy; it is a strong active poison, which when placed upon the food of any animal will kill that animal if it eats it; but it will not kill those insects that do not eat the substance of the plant they live on but simply suck the sap from below the surface. The remedies for such insects are whale oil soap, kerosene emulsion or some oily substance which runs over the body of the insect and stops up its breathing pores, and kills the insect in that way. The lime and sulphur wash is partly of this nature. In the case of the San Jose Scale, the remedies eat their way or soak through the waxy scale which protects the insect and get at the insect underneath. It is because of this shield or covering that the San Jose Scale is so difficult to fight against. There are special remedies for the different classes of insects. These must be found out, and the most practical remedy is the one which does the work best at the lowest cost. The fruit growers' watchword is, "Be constantly on the alert; begin early and do everything thoroughly."

A SEASON'S OBSERVATIONS IN THE PEACH ORCHARDS OF GEORGIA.

By A. B. Cutting, O.A.C., Guelph.

During the past season I had the privilege and the pleasure of visiting some of the great peach orchards of Georgia. Previous to my visit, I imagined that I possessed a fair knowledge of peaches and of the peach industry; while in Georgia I discovered that I did not know quite so much as I thought I did, and I learned that the more one learns about peaches the more there is to learn. Since my return to Canada I find that I did not learn all that there was to learn, nor did I learn all that I might have learned; and now, after listening to the very interesting and instructive addresses of Prof. Taft, of Michigan, and Mr. Owen, of Ohio, yesterday, and after hearing the report of Mr. Hilborn, of Leamington, to-day, I am at a loss to know what I know about peaches anyway. In fact, the more I see and the more I hear and learn of peaches, the wider the subject grows and the farther away it appears to recede from my grasp. At any rate, I do not profess to be an expert or authority on peaches. I am here simply to give you a few ideas that were pointed out to me in Georgia.

In the course of my observations I looked into nearly all the phases of the industry. I gleaned pointers on nursery practice, on laying out and planting the orchard, on cultivation, pruning, spraying, harvesting, marketing, disposing of the surplus fruit, manufacturing and handling the by-products, transportation, etc., and in doing so I visited a large number of orchards; but as time presses I shall confine my remarks to the handling of the ripened fruit, the picking, grading, packing, shipping and marketing as carried on in that country. In particular, I shall refer to the methods practiced in the great Hale orchards, where a wide-awake intensive system, on an extensive plan, is carried out.

The Hale Georgia Orchard Company's plantation at Fort Valley, Ga., comprises about 2,000 acres, planted with 25,000 plum trees, all Japan varieties, and 350,000 peach trees, of which 250,000 are fruiting. It is laid out in blocks of 500 x 1,000 feet, with broad avenues named after the various States and nearly three miles long running north and south, and cross streets named after leading horticulturists. In the height of the season 700 people and 100 horses and mules are required to harvest and ship the crop.

When viewing the orchards from a nearby hill, the buildings thereon appear like unto a great city in miniature. Besides the residence of the superintendent there are thirty-six tenement houses right in the orchard, and at fruiting time scores of tents for itinerant fruit workers. A large hotel, known as the "Red Label," accommodates about two hundred.

To describe all the buildings and all the features of the Hale orchards would be a weary task; weary not to the speaker, perhaps, but to his hearers. For this reason I shall do away with comments and content myself and you with merely a brief list of what may be seen at Hale's, the largest peach orchard in the world. In addition to the buildings already mentioned, there are two large packing houses, a large storehouse for empty crates, an office for the timekeeper, an evaporating plant, a grafting house, a blacksmith shop, a carpenter shop, an implement shed, a carriage house, four barns for horses and mules, a building for storing fertilizers, a school house for colored children, hall for colored employees and a colored restaurant.

Among other features of particular interest, a few of the most novel and striking are as follows:

Every year about ten acres of melons and cantaloupes are grown for the employees. These, when ripe, are distributed every morning and evening free to each and every person connected with the orchard.

Policemen are employed to guard the melon and peach plantations during the day, and to keep a general watch over the entire property at night. One of the duties of the night policemen is to enforce the rule: "Lights out at 9 p.m."

A colored school teacher and a colored preacher are included in "Hale's 700." The employment of these two persons tends somewhat to colonize the colored help, and, as a consequence, less trouble and annoyance is experienced by the Hale Company in the management of their labor.

Hale operates and owns a private road machine for making and repairing the avenues and streets of the orchard, which are 40 to 50 miles in length.

In the past and at the present time ordinary large fruit wagons, known as "floats," and drawn by mules, have been used to transport the peaches from the orchard to the packing houses. Next year it is proposed to test the feasibility of using automobiles. Just now a truck automobile is being built for use in the Hale orchards next summer. If the trial proves satisfactory, the mule, the horseless carriage of the south, must give way on the Hale plantation to the automobile, the horseless carriage of the north.

During the fruiting season a string orchestra is engaged to brighten the work of grading and packing in the packing house. Midway in the afternoon, when the rush of an abundant crop has made weary the day's work, the quickening strains of rag-time incite in the hearts and the nimble fingers of the packers a renewed spirit and a fresh vigor. The cost of operating this Georgia orchard for the season of about six weeks amounts to over \$3,000 each day.

PICKING.

Before leaving for the orchard in the morning, each picker is given a sack containing a number of tickets, each ticket bearing the number of the picker to whom it belongs. In the orchard the picker places a ticket in each basket of peaches that he picks.

When the fruit reaches the grader in the shed, he takes care of the tickets that he finds in the bottom of the baskets and gives them to the timekeeper.

The timekeeper credits the grader with the quantity of tickets that he (the grader) has gathered from the baskets, and credits the pickers with the quantity of tickets received bearing that individual picker's number; hence, one lot of tickets suffices for both pickers and graders.

The pickers (packers and graders also) are paid so much per day, with advantage of increase over average number of baskets picked or crates packed during the day.

For example, Hale pays his packers \$1.00 per day for the average number of crates packed that day. If the average for that day happens to be fifty crates, each packer receives two cents per crate for the work he has done. The packer who has packed over 50 (the average) is paid at the rate of two cents per crate, and the one who has packed less than the average receives a corresponding decrease. The following day the variety and grade of peaches being packed may be larger or smaller as the case may be; if the former, the average will be higher, and the packers will receive a lower rate per crate, or if the latter, a relatively low average will be the result and a correspondingly high rate per crate.

This system of paying the fruit workers—known as the "average system," is satisfactory both to employer and employee. The former gets more work done for less money than he could by any other system of payment, and the employee who is a little better than the other fellow feels that his efforts are being substantially recognized. Personally, I may say that at first I thought the system unfair to the employee, and it certainly would be if all the packers were experts, as then the average would always be high; but, after talking with the packers, I found that all appeared to be pleased and satisfied with the method on account of the fact that every day new and inexperienced hands are employed who tend to keep down the average, and enable thereby the best workers to make a good showing above the average for the day.

To fully illustrate the advantage of the system to the employer, I noted, on a particular day, the difference between the results of this system and those of a system practiced on a neighboring orchard.

Hales, 80 crates for \$1.00 (average system).

Neighbor, 40 crates for \$1.00 (day system).

I have referred to the packers and packing for convenience in explaining the system, not because they alone are paid in this way. Such is not the case, as the same method is used in paying the pickers and the graders, and with the same degree of satisfaction and success.

Handling the Pickers in the Orchard.—Over every twenty-five pickers is one foreman, with assistant if necessary. To prevent delay, each picker carries a couple of baskets to the orchard where they are started picking, one picker to a row. When picking, a ticket is first placed in the basket, then the peaches, and when the basket is full it is left under the tree. The baskets are then carried by boys to convenient places for loading on single-horse orchard waggons (known in Georgia as "Dunkirks"), which go about among the trees gathering up the baskets and carrying them to the avenues, where they are transferred to larger waggons ("floats," before mentioned) that ply between the orchard and the packing shed.

These floats leave the barns loaded with empty baskets in the morning. In the orchard the empties are distributed by basket boys, who should keep ahead of the pickers to prevent loss of time. Four or five basket boys are required for twenty-five pickers. Two boys are also employed to keep pickers supplied with drinking water. This is merely an outline of the orchard practice, and may not be suited to all conditions, as at all times and in all orchards it is necessary to adjust labor to suit existing circumstances.

The trees are gone over two or three times to get the fruit at the proper stage of maturity. Practice soon teaches the pickers the proper stage for picking. In general the fruit is in the right condition when it is full grown but yet firm, and when the ground color takes on a faint yellowish tinge.

Q.: Do they pick from ladders?

Mr. Cutting: No; all the trees are picked from the ground; they are very low-headed.

GRADING.

Each packer has a grader, who grades the peaches according to variety. Each variety is usually assorted into three grades, each grade being marked in accordance with the grade mark chosen by the grower, as there have been no uniform marks adopted as yet in Georgia. Hale marks the first grade Extra Fancy; second, Fancy; the third the name of the variety only. Thus:

No. 1—X Fancy Carman.

No. 2—Fancy Carman.

No. 3—Carman.

Sometimes a fourth grade is made and marked "Choice"; i.e., a size that is midway between Nos. 2 and 3.

The graders are constantly watched and instructed by experts. All ill-shaped, bruised, rotten and very small peaches are thrown out and sent to the distillery. The best of them may be used in the cannery or evaporating plant.

As a rule the Georgia growers prefer hand-grading to machines. Mr. S. H. Rumph, of Marshallville, Ga., the originator of the Elberta peach, favors the mechanical grader, and has a number of them in operation that do very good work. They are made by Messrs. Maull & Miller, Crescent City, Fla. Personally, I noticed that this particular grader was all right, as far as the assortment of sizes was concerned, but it failed to reject the bruised and bad-shaped fruit, and, besides, I was rather disappointed with its speed. I would not presume to condemn it, however, as I may not have seen it under

favorable conditions. Hale says this is probably the best grader made, but all are unsatisfactory.

Under the head of picking we have already considered the method of keeping tally with and paying the graders.

PACKING.

Hale uses different packs for the different varieties and grades, the size of the peach determining the pack to use, and all his peaches are packed in the standard six basket Georgia carrier. As it is rather difficult to explain verbally or in writing the various packs used, I shall now practically demonstrate the methods as far as possible, and, if desired, I shall furnish cuts for insertion in the annual report of the Fruit Growers' Association.

For sizes or grades that make three layers in a basket or "cup" of the carrier, a 2-2, a 3-2, or a 3-3 pack may be used. For four layers, a 4-3 or a 4-4 pack can be used, but it seldom pays to systematically pack peaches of this size. For two layers (usually first grade), it is best and necessary in most cases to use a 2-1 pack, although sometimes to make the cup high enough it is necessary to place the bottom layer on end.

With some varieties and grades it is often necessary to use a different pack in the bottom row than is used in the upper cups; e.g., X Fancy Hiley.



Picking Baskets and Carrier of second grade Elbertas, showing a 2-1 pack.
(Photo. by G. H. Powell, Department of Agriculture, Washington.)

Bottom row, 2-2 pack, 3 layers, peaches packed flat.

Upper row, 2-1 pack, 2 layers, under on end, upper on side.

The carriers used for grades Nos. 1 and 2 are neatly labelled. No. 3 goes into plain crates, having no mark other than the name of the variety. In all of them the peaches are firmly packed to prevent change of position and bruising while in transit. The rosy cheek of the peach is placed uppermost, and the peaches are all pointed the same way in the cup. When the carrier is filled, the packer puts a ticket on it and sends it to the nailing table, where it is inspected. If found satisfactory the cover is nailed on immediately and it is carried to the car; if not packed to suit the inspector, it is sent back to be repacked by the packer, whose number corresponds to the number found on the ticket.

Some growers use what is termed a "spring" pack; i.e., a full layer on the bottom of the cup, a partial layer in the centre and another full one on top. In reality, it is a false pack, and one that is unsatisfactory, as it is liable to become loose before it reaches the market. Other growers use a two-layer pack, with both layers on end. Peaches packed in this manner are apt to become crushed through pressure of the crate top on the tender end of the peach.

THE GEORGIA CARRIER.

In Georgia they use a light carrier containing six baskets holding four quarts each. It is a very strong package, gives good ventilation, is neat in appearance, and costs only twelve cents with the divider, six baskets and cover. It is put together with strong wire staples well clinched on the inside. The panel heads afford a sure grip to the hands, and damage from breakage rarely occurs. When loaded in cars, the shape of the package permits a perfect fit; the tiers are separated for ventilation by means of inch slats tacked across the ends of the packages.

Yesterday Prof. Taft. referred to this carrier in connection with his remarks on the packing of fancy peaches in Michigan. Nearly all the southern States have adopted it. Texas, a coming peach State, and where to-day thousands of acres are being planted, adopted it at the outset. I intend to introduce it in the Argentine Republic, where in a few months I expect to direct the planting of a large orchard. In Canada, where no uniform peach and plum package has yet been adopted, it should receive the closest examination and the consideration of each and every grower. Even though it would cost more to make it in the north than in Georgia, the package would be cheap at twice the price mentioned.



Peaches wrapped for Export.
(Photo. by G. H. Powell, Department of Agriculture, Washington.)

WRAPPING PEACHES.

Experience is teaching the Georgia grower that it pays to wrap peaches. It prevents bruising and the spread of Monilia (brown rot), adds to the appearance of the package, and, above all, it increases the profits. Trial shipments repeatedly have brought fifty cents per carrier more than for unwrapped. This is worth considering, when the extra cost to wrap a carrier amounts to no more than six cents. Fairly heavy paper has given better results than light.

One report from New York last season stated that in carriers that contained unwrapped peaches, 10 to 15 per cent. were bad, while only 3 per cent. were bad in carriers that were wrapped.

Wrapping seems to add or bring out the color. Mr. Hale says: "Wrapping is decidedly the best paper for soundness and color." Next season he expects to wrap a large portion of his output. Other growers in middle Georgia and most of those in the northern part of the State are planning to do the same.

In cold storage, the effect of wrapping is not so noticeable on peaches as on other classes of fruit, mainly because peaches as a rule are not stored long enough for any advantages to be well marked. Experiments show, however, that wrapped peaches retain their firmness and brightness longer, and are less apt to show a discoloration of their compressed sides when removed.

SHIPPING.

At the Hale orchards the carriers are loaded into the cars at the packing house, and through trains carry them to New York and all points in the north. A fast schedule is arranged for these trains to deliver the fruit on the market in the best possible condition. The cars are iced three times between Fort Valley and New York. Cars 50 feet long loaded about two-thirds full carry 560 carriers 5 tiers high; in wet seasons, one tier less.

There are many different types of refrigerator cars now in use, some with the ice chambers on the end, some iced overhead and others iced in various ways; none are entirely satisfactory. The objection to them lies not in the method of icing alone, but in the lack of proper ventilation, and, as a consequence, it is difficult to maintain an even temperature. Investigations show that different temperatures are found in different styles of cars and in cars of the same style. As a rule, the temperature at the top of the car ranges ten degrees higher than that at the bottom. This, aided by the moisture thrown off from the fresh peaches, is favorable to the spread of brown rot, and should be remedied.

Quick refrigeration is essential to prevent the spread of this fungus, which can do so much damage in twenty-four hours. No refrigerator car yet constructed, whether in Canada or the United States, can give quick refrigeration. For this reason, it is advisable, when possible, to have the fruit cooled before it enters the car. Furthermore, the fruit can be picked in better condition, riper and more mature. A local cold storage plant adjoining packing house into which the fruit could be placed and cooled before it goes into the car should be considered a part of the equipment of our up-to-date orchards. Such is feasible, however, only on large plantations or in connection with Mr. Owen's suggested co-operative central packing house.

MARKETING.

Mr. Hale ships to only one commission house in the same market. By doing so, he does not compete against himself, and, by careful grading and honest packing, his fruit is often sold before it reaches the market. He keeps in close touch with his commission man and with the market generally. He uses a private telegraph code to make communication secret and to lessen the expense of telegraphing.

Some markets prefer a yellow-fleshed peach to a white, and vice versa; e.g., New York favors the yellow, while Philadelphia prefers the white. Large peaches do not always bring the most money; as a rule, they bring less. On many occasions I have known second-grade Elbertas to sell for twenty-five cents and more per carrier over the same day's quotation for first grade. Georgia peaches always bring top prices in all markets.

THE SURPLUS AND BY-PRODUCTS.

The question of handling to advantage the surplus and by-products of the peach industry is a most important one to all orchardists. There is no necessity for the grower to suffer loss in seasons of abundant crops when there are so many ways in which the surplus fruit, both good and bad, may be saved from the hog pen and the compost. Numerous and varied methods are resorted to in Georgia and elsewhere. I have time only for a list, which is as follows:

Commercial canning, home canning; peach pulp, jelly, jam and "butter"; evaporating and drying; crystallized peaches; distilling, peach brandy, wine and vinegar; pits sold to nurserymen.

FIRE BLIGHT.

By H. C. Harrison, Professor of Bacteriology, Agricultural College, Guelph.

"That species of blight which is sometimes called the 'fire blight' frequently destroys trees in the fullest apparent vigor and health, in a few hours turning the leaves suddenly brown as if they had passed through a hot flame, and causing a morbid matter to exude from the pores of the bark of a black, ferruginous appearance. This happens throughout the whole course of the warm season. More frequently in weather both hot and moist." So wrote William Coxe in a book on the "Cultivation of Fruit Trees," published in 1817, which is said to be the oldest American book on fruit culture.

Nearly forty years before this we have a record of the disease mentioned in a letter written by one, William Denning, who first saw the disease in the Highlands of the Hudson, in 1770. He described the disease fairly well and thought it was due to a borer in the trunk of the tree.

From 1817 almost to the present time, we find in horticultural literature many theories as to the cause of the blight. It would be tedious to give an account of all the different theories put forward by various writers during this period. The most diverse views were entertained as to the cause of the disease and it was a constant topic for discussion in the horticultural journals and societies. These discussions were so wearisome and so barren of results that the Western New York Society resolved that the subject should not be discussed at their meetings unless some one had something entirely new concerning the disease to communicate.

Amongst the numerous theories put forward to explain the cause of pear blight, we may mention the following:

1. Insects.
2. Rays of the sun passing through vapors.
3. Poor or deleterious soil.
4. Violent changes of the temperature of the air, or the moisture in the soil.
5. Sudden change from sod to high tillage resulting in surfeit or over plus of sap.
6. The effects of age; old varieties being most subject to it.
7. Autumn freezing of unripe wood, which engendered a poison that destroyed the shoots and branches in the following season.
8. Electricity, or atmospheric influence.
9. Freezing of the sap, or freezing of the bark.
10. The heat of the sun assisted by raindrops acting as lenses causing the scalding of the sap and bursting of the cells.
11. Fermentation of the sap.
12. The absence of certain mineral matters in the soil.
13. An epidemic transmitted from place to place by the air.
14. Fungi.

Each of the above theories was sustained by various writers, and it may be of interest to note that Henry Ward Beecher was an advocate of the theory that the cause of blight was due to the autumn freezing of unripe wood.

A. J. Downing, the distinguished author of "Fruits and Fruit Trees of America," applied the name "Frozen-sap blight" to the disease. His theory was that the disease was due to the freezing and thawing of sap. The sap thus lost its vitality, became dark and discolored and poisonous to the plant.

Thomas Meehan, editor of the "Gardeners' Monthly," supported the idea that fungi were the cause of the disease; but no tests were applied to prove that the inoculation of these fungi into healthy trees would cause the disease.

It was not until the year 1878, when W. T. Burrill, the Professor of Botany in the University of Illinois, announced to the State Horticultural Society the discovery of bacteria apparently connected with the disease. Burrill also proved that the disease

was infectious and could be communicated to healthy limbs by inoculation, using the gummy exudation from an affected tree as a virus. Not only was he able to produce the disease in pears, but also in apples and quinces. Dr. J. C. Arthur, Botanist of the New York Experiment Station, subsequently confirmed Prof. Burrill's results and thoroughly established the fact that a certain species of micro-organism, named by the discoverer *Bacterium amylovorum* or the starch-destroying bacterium, was the sole cause of the disease.

GEOGRAPHICAL DISTRIBUTION.

This disease is peculiar to North America. So far it has never been recognized in Europe. Prof. Budd, of Iowa, who is familiar with the disease as it occurs in North America, has inspected the orchards of Europe, and states that no trace of fire blight of pear or apple trees can be seen in Europe. It is also known in New Zealand, and Australia. In North America the blight extends from New York to California, and from the northern counties of Ontario to Texas. Dr. Beadle, in a sketch of the history of the disease in Ontario, states that, "In the early days of fruit-growing in the Niagara district we had no pear tree blight nor apple blight. With the advent of what people termed grafted fruit there came, after a few years, 'blight' on the pear tree . . . By the year 1840 it had spread considerably."

N. J. Clinton, of Essex County; S. Hunter, of Oxford; E. D. Smith, of Wentworth; Stone and Wellington, of Welland; R. Hamilton, Argenteuil, reported its presence in their respective counties about 35 years ago. The colder parts of the Province have suffered as severely from the disease as the more favored districts. The orchard of the Dominion Experimental Farm at Ottawa has been attacked, and the 140 Russian varieties of apples cultivated there have suffered severely. In warmer districts, however, the disease has been much more severe. Whole orchards have been completely destroyed in the State of Texas, and certain pear-growing districts in that State have been practically ruined by this parasite.

LOSSES.

No statistics are available to give us an idea as to the amount of loss to fruit growers from pear blight, but a few references to losses by this destructive disease will help to give us an appreciation of the subject. Coxe in 1817 reported that he had lost upwards of fifty trees in twenty years. In the years 1826, 1832 and 1844 there was an increased prevalence of the disease and few pear orchards escaped without partial or total loss of many trees, and some orchards were quite destroyed. Downing called it the "monstrous malady of the pear." Lyons stated, as the opinion of many cultivators in the State of Michigan, that "The pear tree cannot be grown with financial success on account of the blight." Hallam in 1882 reported that, "In Southern Illinois pears have failed—utterly failed, so that none are now cultivated for market. The blight has destroyed the trees, branch and root." While A. Noice, of the same State, doubted "if one-tenth of the pear trees that are planted lived ten years on account of this destructive agent." E. H. S. Dart stated that the severities of winter were not so much to be dreaded as the ravages of blight. He had in 1874 one to two thousand trees affected. Dr. P. A. Jewell in 1876 lost 10,000 Tetofsky apple trees by it. Bailey, of Cornell, declared that fire blight was undoubtedly the most serious disease with which the quince grower has to contend. It was the same disease which was so destructive to pear orchards in certain years and to certain varieties of apples, particularly the crabs. Selby, of Ohio, reported that the disease ranked among the most destructive known to the orchardist in his State. Chester, of Delaware, announced that pear blight was of unusual severity during the season of 1901 and caused much alarm because of its rapid spread through the orchards of the State. In 1895 its ravages were most severe on apple trees in the vicinity of Hamilton and Burlington Bay. J. Craig gathered information as to

the character of injury of the disease from fruit growers throughout this Province, and a number of these stated that the injury was very severe.

These citations are enough to show that the disease is of special economic importance and greatly dreaded by many fruit growers.

SYMPTOMS.

The first indication of fire blight is seen either in the browning and subsequent blackening of the leaves or of the young twigs or of young tender shoots. When the twigs or shoots are the principal parts affected, the disease is spoken of as twig blight. Pears show the presence of the disease more frequently by the blighting and blackening of the leafy tufts of the spurs, and show it especially by the darkening of the blossom clusters on the larger branches; while later, the branches themselves become blackened. The progress of the disease is always downward; an inch or more each day,



Fig. 1.—Showing the result of inoculating a terminal shoot with a pure culture of the Fire Blight organism by puncture at the point A.



Fig. 2.—Showing the blighting of a terminal shoot by inoculation of the terminal bud with a pure culture of the Fire Blight organism. (After Chester).

depending upon the season, until the larger limbs are infected. In the more susceptible varieties it spreads more quickly, involving the whole tree; but in the more resistant varieties the progress of the disease is not so fast. When the disease is active the bark of the diseased branches cracks, and a thick, blackish, gummy fluid exudes, and later the affected bark becomes hardened, dry and shrunk. The disease occasionally appears on the larger branches and trunks of fruit trees, when these have been bruised or otherwise injured, when its appearance is similar to the injury known as "sun-burn" or "sun-scald." This disease of the trunks or larger branches is sometimes spoken of as "body blight" or "rough bark." The inner bark and cambium layer of the limbs and trunks are the most important parts of the tree killed by the blight. Instances are known of its

attacking the fruit, producing watery ulcers accompanied by brown discoloration and decay. The disease may be known by its peculiar odor, said by some writers to resemble putrefaction.

When the disease is in progress, the discolored blighted portion blends gradually into the color of the normal bark; but when the disease has stopped there is a sharp line of demarcation between the diseased and healthy portions. (Waite.)

MICROSCOPIC APPEARANCE OF THE DISEASED TISSUES.

The most conspicuous change in the tissues affected with the blight, is the disappearance of the stored starch, and on account of this peculiarity the organism has been named the "starch destroying bacterium" (*Bacterium amylovorum*). The germ penetrates from one cell to another and produces a gummy or mucilaginous matter which is found on the exterior of the affected parts. The microbe is found, as a rule only on the inner bark and in the actively growing tissues (called the cambium, which produces wood on the inner side and bark on the outer side). The organism is unable to grow in tissues that are lignified or woody.



Fig. 3.—Fire Blight bacteria (*B. amylovorum*). x2000.

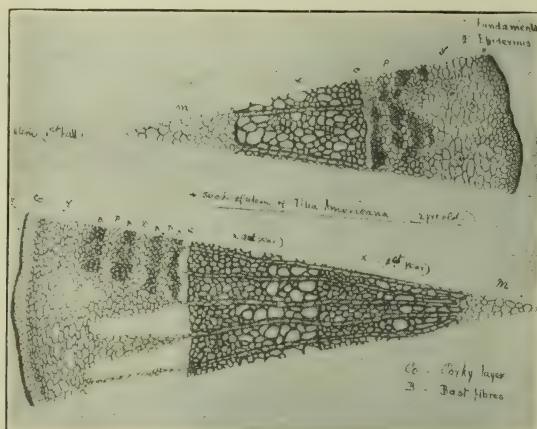


Fig. 4.—Cross section of a one and two year old stem. Fire blight bacteria grow in the cambium (C) and inner bark (B). E—epidermis. Co—Corky layer, B—Bast fibres, P—Parenchyma, C—Cambium. X—Xylem or woody tissue. M—Medulla or pith.

LIFE HISTORY OF THE PEAR BLIGHT GERM.

The organism which produces the disease is a small motile bacillus which increases with great rapidity in the succulent parts of affected trees. The microbe is of microscopic size, so small that 25,000 placed end to end would only measure an inch. They are able to live and multiply in the nectar of the blossoms from whence they are carried to other flowers by bees and insects which visit the blossoms for honey and pollen. From this locality the germs extend into the tissues, and then downward into the branches by way of the inner bark, girdling the limbs and causing a large amount of damage. The blight germ also gains entrance to the plant through the tips of growing shoots, thus producing twig blight. The organism is not killed by the winter frosts but lives in the bark in a dormant condition until spring. As soon as the plant tissues become gorged with sap in the spring the microbes, which have remained alive all through the winter, start to grow and extend into the new bark. This new blight

which develops in the spring can be recognized by its moist and fresh appearance from the blighted, dead and dried bark of the previous summer. A large amount of gum is exuded from the affected bark and runs down the tree and attracts to it bees and other insects which carry the microbes to the early blossoms, and from these first flowers it is carried to others, and thus the disease extends.

The germ has never been discovered in the soil, although careful search has been made. Hence the importance of recognizing the winter form of the disease, for if these affected portions of the tree are cut out and destroyed, the pear blight question is solved, for without the microbes there can be no disease.

CONDITIONS AFFECTING THE SPREAD OF THE DISEASE.

Fire blight differs in severity in different localities, and there are a number of conditions which affect the character and progress of the disease.

Every tree of the pome family is subject to the blight, but pears and quinces are more susceptible than plums and apples. The mountain ash, service berry and hawthorn are frequently diseased, but not to such an extent as the first named trees. There is a difference in the susceptibility of varieties. Thus among pears, Clapp's Favorite, Flemish Beauty, and Bartlett, are more liable to the disease than Keiffer and Duchess, and amongst apples, the crab varieties are the least resistant.

Climatic conditions influence the disease, warm, moist weather with much rain favor it, whilst bright, dry, sunny weather tends to check it.

High cultivation, rich soil, heavy manuring, free use of fertilizers, heavy pruning, or any other treatment which has a tendency to induce new and succulent growth, favors the disease, as the bacteria grow with greater rapidity and penetrate more quickly from cell to cell when the tissues are gorged with sap. Insects are more partial to young succulent shoots and leaves, and the bites and punctures of such insects whose mouth parts may be contaminated with pear blight germs often serve to infect the tree.

It is thus manifest that healthy, thrifty, vigorous, well-fed and well-cultivated trees are more liable to the disease than others, and hence the severity of an attack of fire blight may be lessened by conditions which are under the control of the grower.

TREATMENT.

The treatment of fire blight is of two kinds—that which is designed to put the tree in a condition to withstand the attack of the blight microbe, and those methods which aim at the extermination of the causal bacterium. Unfortunately all methods which are used for hindering the attack of the microbe consist of restraining the full development of the tree, and hence any such system of procedure should not be followed, unless an orchard is very badly attacked.

High cultivation, winter pruning and the other conditions already mentioned, as predisposing trees to blight should be avoided, but the trees should be allowed to ripen the wood, and in order to do this the fruit grower must use any method which will check the amount of moisture in the soil, for instance, by the growth of a clover crop.

The fire blight organism cannot be exterminated by spraying, as the microbe lives in the tissues beneath the outer bark, and it is impossible to reach it with any spraying solution, for unless the bacteria come into contact with the germicide, spraying is ineffectual.

There is, therefore, but one remedy, to cut out and burn the affected parts of the tree. It is very necessary when cutting out a diseased branch or twig to cut well below the discolored portion, as the bacteria are in most cases far below the discolored portion, the discoloration not being produced immediately upon the appearance of a few bacteria, so that if only the discolored portion were cut off, numbers of bacteria would still be left in the stump, and these would continue to multiply, and the disease would soon be evident again.

Cutting of affected parts may be done at any time in the winter and spring, but it is not advisable to cut in the growing season, as fresh cases may be constantly occurring, and these, owing to lack of sufficient development, would not be seen.

The best time for cutting out affected branches is towards the fall, or when the trees have stopped forming new wood, when most of the blight has developed, and when the contrast between the discolored leaves and branches and healthy tissue is easily seen.

Trees should be carefully inspected for blight during the winter, and in spring before the blossoms come out, in order to destroy any affected parts that have been missed at previous inspection.

All wild trees of the pome family in the vicinity should be examined as well, as these, if blighted, may serve to reinfect an orchard which has been carefully treated.

In cases where the bark of the trunk is affected, it can be cut out and the wound covered with a lead and oil paint. The cut surface of branches over one-half inch in diameter should be painted.



Fig. 5.—A pear orchard badly infected with Fire Blight.

NEW FRUITS

By Prof. H. L. Hutt, Guelph.

Your Committee on New Fruits, which is composed of Mr. W. T. Macoun, Mr. L. Woolverton and myself, have to report upon the new and seedling fruits which appear from year to year. Most of these are sent in to the different members of the committee from all parts of the country. In the past I have always presented the report

for the committee as a whole, but this year Prof. Macoun has had so many interesting seedlings to fruit with him at the Central Experimental Farm at Ottawa that I have requested him to present that part of the report himself. I have to report, therefore, upon the new fruits which have come before Mr. Woolverton and myself. Quite a large number of samples have been received and examined, but as a rule with chance seedlings it is only one in a thousand that is equal to, or shows any improvement upon its parents. This year more really promising seedlings were received than usual, and as we believe it is a mistake to encourage the introduction of new varieties unless they are really superior to those already in cultivation, we shall call attention only to some of the most promising.

SEEDLING APPLES.

1. From John Bertram, Dundas. Received Sept. 1st. Size medium to large, oblate ($3 \times 2\frac{1}{4}$), wide shallow basin, calyx open, cavity broad, shallow; stem medium; skin yellow and prettily covered with light red; flesh white, mealy, fair quality and a pretty red apple about season of Duchess.

2. From W. T. Waller, Napanee. Received Sept. 12th. A beautiful red apple, something like Wealthy or Western Beauty. A chance seedling which grew up beside a building. Has borne regularly for the past two or three years. Is now about six inches in diameter and about three bushels of fruit this year. This is certainly one of the most attractive apples we have seen in some time, but it so nearly resembles Wealthy in size, shape, appearance, quality, and season, that it is doubtful if it would be advisable to propagate it as a new variety, unless upon further trial it proves superior to Wealthy.

3. From George P. McNish, Lyn, Ont., shown at Toronto Exhibition and reported upon last year. A large conical white fall apple, with bright red blush, and dotted red on sunny side. Flesh white, crisp, juicy, with pleasant sub-acid flavor. Would make a pretty dessert apple for home use, but too white in the skin to be of value commercially. Might be valuable for the north.

4. From Prof. Campbell, Yoho Island, Lake Joseph. Received Sept. 19th. A small to medium-sized apple, roundish oblate, shallow basin and cavity, closed calyx and short stem. Beautiful dark red with white dots on a yellow skin. A good winter variety, hardy enough to stand the rigors of that climate, is just what the people of that northern section are in need of, and it is possible this seedling may be valuable for that purpose.

5. From E. E. Anderson, Wyoming, Lambton County. Received Sept. 25th. Medium sized, oblong conic, oblique, handsome bright red, something like a Brockville Beauty: flesh whitish, crisp, juicy, brisk sub-acid, good quality: a good apple, but would not take the place of Gravenstein, which is about the same season.

6. From G. G. White, Paris. Seedling Apple, ten or twelve years old, second crop this year. Tree vigorous and thrifty. Two bushels this year, two dozen last year. Medium to large, showy red apple, yellow flesh, coarse-grained, fair dessert quality and said to be an excellent cooker. Season, October and November. A very good apple, but not enough better than others of the same season to make it worthy of introduction.

SEEDLING PEACHES

1. From W. K. Ireland, Owen Sound. Received Sept. 10th. This was a peach of medium size, and of a very rich golden color with bright red cheek. The flesh was rich yellow, juicy, of good quality and parted freely from the stone. If, in addition to its other good qualities, this peach possesses any extra hardness in the tree, which we would naturally look for in a seedling grown so far north of the regular peach sections, it would certainly be well worth propagating. Seedling from a four-year-old seedling of unknown origin.

2. From Wm. Forester, Oakville. A very large, handsome, yellow-fleshed peach, shown at Toronto Exhibition, August 8-12; looked like a Wheatland.

3. From Miss Thompson, Queen street, Guelph. Received Sept. 18th. A good sized, yellow flesh, free stone, of handsome appearance and good quality. From a seven-year-old seedling that has been bearing for several years.

4. From James Mitchell, Paisley Block. Received Sept. 3rd. Medium sized, golden yellow, nearly covered with red, handsome, suture indistinct, fruit rather oblong, stem set rather deep, flesh yellow, juicy, rather poor quality. free stone, ripe.

5. From Jos. Carter, Liverpool street. Received Sept. 3rd. Small, yellow, roundish, marked suture, stem set deep, not showy, flesh pale yellow, stringy, fair quality, free stone, nearly ripe.

6. From Thos. W. Todd, 1,273 Queen street west, Toronto. Received Sept. 25. Large, round, very distinct suture, greenish-yellow, sparsely covered with dull purplish red, not showy, free stone, yellow flesh, juicy, very red around the pit. Quality fair.

7. From Thos. W. Todd. Medium-sized, roundish, pointed, suture fairly distinct, deep at the point, rather deep cavity, color orange yellow, well covered with dark red, showy, tough skin, persistent cling stone, yellow flesh, juicy, but tough, only fair quality.

8. From M. E. Wilson, 40 Bismarck street, Toronto. Received Oct. 10th. A large oval, yellowish-fleshed peach, dark red on sunny side, free stone of good quality; season, first week of October.

SEEDLING PLUMS

1. From Alex. Glass, shown at Toronto. Received Sept. 9th. A large showy plum, a seedling from Glass Seedling, but it so nearly resembled its parent that it would not be wise to introduce it as a distinct variety.

2. From Frank Kean, Orillia. Received Sept. 14th. A large, handsome, very dark purple plum, with heavy blue bloom, roundish. good quality. somewhat resembling "Shipper's Pride." It is a seedling of the Lombard, but is larger than that variety usually grows, is quite round in shape, and of a dark purple color. The quality was excellent and it is to be hoped this tree may be extra hardy, originating as it has on the northern limits for the culture of that class of plums.

3. Samples of a very large and showy Americana seedling were received from Mrs. Lindsay, of Guelph. This plum was of excellent quality, and would be well worthy of a place in the home garden, even where the European and Japan varieties succeed.

GOOSEBERRIES

There is a great difference between the American and European varieties of gooseberries in their susceptibility in this country to mildew. The American varieties are almost invariably free from it, while the European varieties very seldom escape it. I have at the College, however, a variety of unknown origin of the European type obtained a few years ago from Mr. Crosby of Highland Creek, Ont., which bears larger berries than any other variety in our collection, and has never yet shown signs of mildew. The berries are long, oval, dark red, and of good quality. The bush is vigorous and hardy, but of a sprawling habit of growth, and, although not as productive as Whitesmith, the berries are nearly half as large again.

A case of wax models was used to illustrate this report in which each variety mentioned was represented in wax, so life-like that it would be difficult to distinguish the natural from the artificial. These models were made by Mrs. Stanley Potter, who is employed at this work at the College.

REPORT OF NEW FRUITS.

By W. T. Macoun, Horticulturist, C. E. F., Ottawa.

There were about the same number of seedling fruits as usual sent in for examination this year, but, as in the past, only a very small proportion were as good as the named varieties already on the market. The following are the best of those tested :

1. From Lack Daniel, Lindsay, Ontario, Seedling Apple. Size large, form roundish; cavity shallow, open; stem short; stout; basin medium depth and width, almost smooth; calyx closed; color pale greenish-yellow, almost greenish-white, with a bright pink blush on sunny side; dots moderately numerous, grey and green; skin moderately thick, tender; flesh white, crisp, tender, juicy, core small; flavor mild sub-acid, pleasant; quality good; season evidently mid September to November. November 4th, 1903, still in condition. A promising variety resembling Princess Louise in appearance and quality, but earlier. Evidently a seedling of Fameuse. Still in condition, November 5th, 1903. Received from T. Os. Leall, Lindsay, Ontario.

2. Sport from C. H. Snow, Cumming's Bridge, Ont. Size above medium to large; form oblate, conic; cavity deep, open; stem short, stout; basin medium depth and width, wrinkled; calyx closed; color greenish-yellow, almost covered with dark red; dots moderately numerous, yellow, distinct; skin thick, moderately tough; flesh white, tinged with red, crisp, juicy, tender; core small; flavor sub-acid, pleasant; quality good to very good; season early to mid September. Thought to be a sport of St. Lawrence, which it resembles in shape, flesh, and somewhat in flavor. However, does not appear to be as highly favored at St. Lawrence. Promising.

3. From Thos. Connolly, Lindsay, Ont. Seedling. Size larger; form oblate; cavity medium depth and width; stem short, stout; basin medium depth and width, smooth; calyx open; color pale greenish-yellow, with traces of pink on sunny side; dots moderately numerous, indistinct grey and green; skin thick, tough; flesh yellow, crisp, juicy; core medium; flavor sub-acid, sprightly, pleasant; quality good; season probably early to mid winter. A promising seedling, but may not find a place.

4. Rideau. (Wealthy, female, and Duchess, male.) Form roundish, angular; size medium to large; cavity deep, open; stem short, stout; basin deep, open; calyx open or partly open; color pale yellow, well washed and splashed with bright crimson, especially on the sunny side; dots numerous and small, indistinct; bloom none; skin moderately thick, tender; flesh yellowish, firm, coarse, juicy; core rather small; flavor sub-acid, sprightly, aromatic, not high; quality good; season late September. Resembles Duchess somewhat in outward appearance, but is longer. There is a suggestion of Wealthy in flavor and sprightliness. Is showing indications of watercore, though flesh is remarkably firm. A handsome apple and may be useful as coming between Duchess and Wealthy. A cross made by Dr. C. E. Saunders in 1894 and fruiting this year for the first time.

5. From C. A. Cass, L'Original, Ont. Seedling Apple. Form roundish, conical; angular; size about medium; cavity narrow, medium depth; stem short, moderately stout; basin narrow, shallow to medium; calyx open; color pale yellow, well washed and splashed with crimson; dots obscure; skin moderately thick, moderately tough; flesh white, tender, melting, juicy; core medium size, open; flavor mild sub-acid, good; quality good to very good; season probably January and February. Bore in 1902 for the first time; nearly a barrel taken off. Probably a seedling of Fameuse. Lacks sprightliness. Same season as McIntosh and Fameuse.

6. From L. L. Livingston, Frankville, Ont. Form oblate; size medium; cavity open; russeted, stem short, stout; basin deep, open; slightly wrinkled; calyx open; color greenish-yellow, splashed and washed with dull purplish red; dots few, grey, distinct; skin thick, moderately tough; flesh yellow, crisp, moderately juicy; core small; flavor sub-acid, pleasant; quality good; season later winter. Still in good condition. Would be promising if a little larger. May 2nd, 1903.

A large number of comparatively new winter apples are now fruiting at the Central Experimental Farm, and some of these promise to be very useful in the north and superior to those already grown. Among these must be mentioned Windsor Chief, Milwaukee, North Western Greening, Dempsey's No. 80, La Victoire, all of which are good keepers. The Edgehill, probably a seedling of Fameuse, which originated in the eastern townships, is a very promising red apple almost equal to the McIntosh in quality and keeping longer than that variety.

It is always interesting to the members of the Ontario Fruit Growers' Association to know what progress is being made in originating varieties of fruit for Manitoba and the Northwest Territories. Already many of Dr. Saunders' hybrids have been brought before this Association. The following six varieties are among the best of these which fruited this year for the first time:

Jewel—*P. baccata* female x Yellow Transparent male.

Robin—*P. baccata* female x Simbirsk male.

Silvia—*P. baccata* female x Yellow Transparent male.

Magnus—*P. prunifolia* female x Simbirsk male.

Betty—*P. baccata* female x Pawaukee male.

Golden—*P. prunifolia* female x Golden Russet male.

Of these the Jewel and Robin are among the best in quality and Silvia is interesting for its earliness, ripening during the second week in August.

PEARS.

Only two seedlings of merit were received:

1. From R. B. Martin, Elmira, Ont. Fruit large, obovate, obtuse, pyriform; color yellow with an orange blush; skin thin, tender; flesh yellowish, tender, melting, buttery; core small, moderately sweet, not highly flavored; quality good. Tested September 28th, 1903. Not high enough flavored to be especially promising.

2. From W. J. Kerr, Renfrew, Ont. Fruit medium size, obovate, obtuse; color yellow, with a faint pink blush; stem medium length, stout; flesh yellowish, juicy, buttery; sweet, but not high flavored. Quality good, season evidently early September, tested September 4th, 1903. Promising, if hardier than Flemish Beauty. Originated in the County of Leeds, said to be a seedling of Bartlett. Tree 20 feet high.

PLUMS.

Few seedling plums were received this year. During the first part of August we had the pleasure of testing the Emerald plum, sent by E. D. Smith, Winona. This plum has already been described in the report on "New Fruits," but is sufficiently promising to be mentioned again.

1. Seedling No. 1 from Thos. Greenfield, Archville, near Ottawa. Fruit large, roundish oval; suture indistinct; apex rounded; color deep purplish red; dots numerous, small, yellow; skin thin, tough; flesh greenish yellow, juicy, sweet; stone large, oval, cling; sweet, good flavor. Quality good to very good. A *Domestica* seedling of the Bradshaw type. Tested September 25th, 1903. Promising for Eastern Ontario.

2. Seedling from H. E. Wright, Summerside, P.E.I. Fruit large, round, oval; cavity, medium depth and width; suture distinct, slightly depressed; apex slightly depressed; color yellow, well covered with deep red; dots obscure; skin moderately thin; flesh yellow, juicy, sweet, rich flavor; stone medium, cling. Quality very good. Tested October 1st, 1903. Raised from stone of a California plum. Ripens a few days later than Moore's Arctic and earlier than Lombard. A handsome, promising plum.

We should again like to draw attention to the Montreal seedling *Domestica* plums as being hardier in fruit bud than most others, and hence promising to be of great value in northern sections.

PEACHES.

Only one seedling peach was received in good condition, but it was a fine one :

From W. K. Ireland, Owen Sound, Ont. Fruit large, roundish; suture distinct, depressed, deepest towards apex; color yellow, well washed with deep red; skin moderately thick, flesh yellow, juicy, sweet, rich, good flavor; quality very good; stone, medium, cling. Tested September 16th, 1903, in prime condition. A promising peach.

GRAPES.

Although no new grapes were sent in for examination this year, a number of the newer varieties fruited for the first time, among these being three of Munson's hybrids, the Manito, Yonago and Atobia.

Of these the Manito is the most promising for northern districts. The following description was made of it :

Manito. Vine a medium grower, productive. Clusters below medium size, cylindrical, sometimes slightly shouldered and moderately loose; fruit below medium size, globular, black, with a blue bloom, skin thin, moderately tender, somewhat acid; pulp very tender, melting, sweet, good flavor; quality good; as early as Champion; a decided acquisition. The Rural New Yorker, in reporting on this variety, says that it ripens just before Moore's Early.

RASPBERRIES

The Herbert again did well this year at the Central Experimental Farm, and, owing to its hardness, productiveness, size and quality, it is considered the best red raspberry, at least for the amateur.

Nothing more to add regarding small fruits.

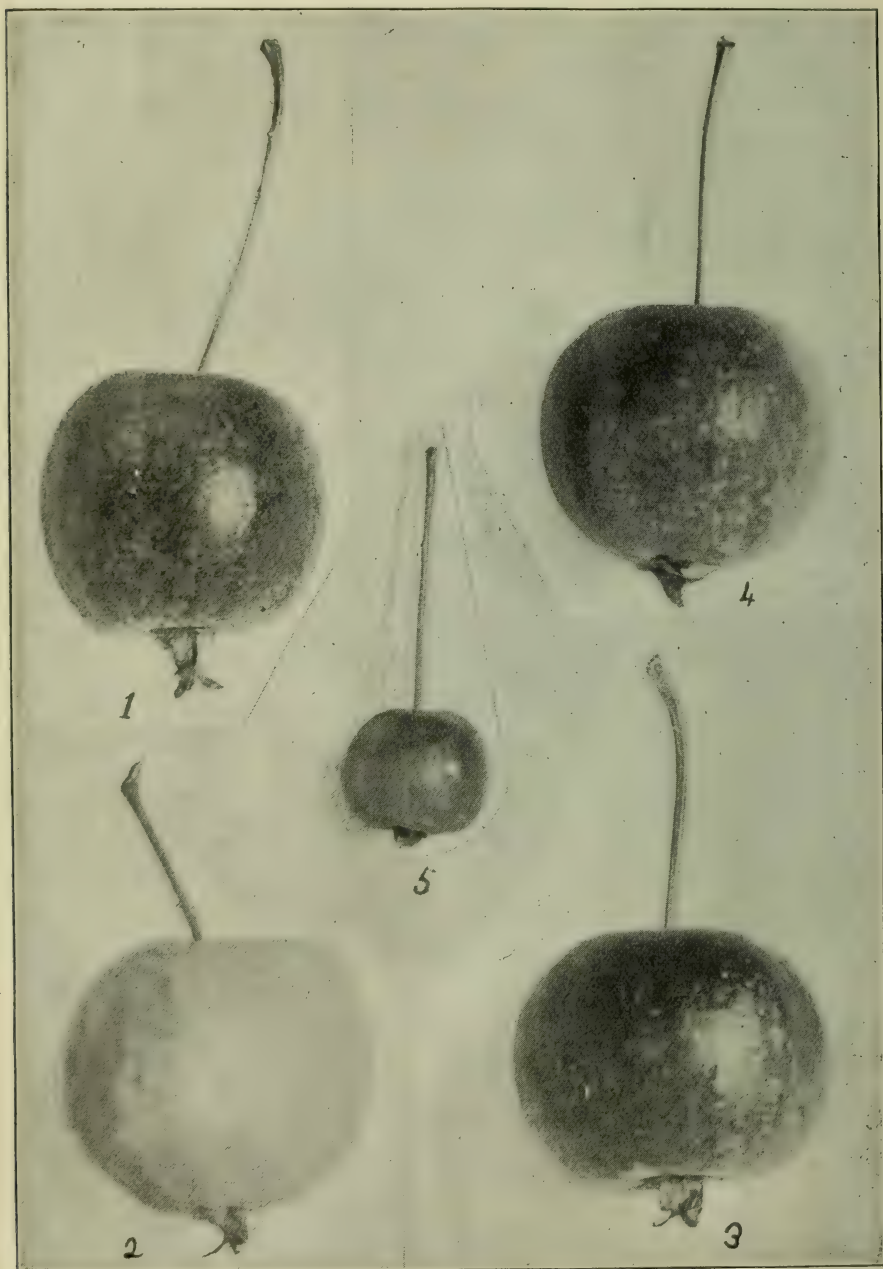
W. T. Macoun : It seems to me that this committee has two leading objects in view. One is to get as much information as we can about varieties of apples grown in other parts of the world that are not grown in Ontario, and to test them for use here and report on them. We are endeavoring to do something in that direction. The other main object is the examination of seedlings sent in from different parts of the country and reporting upon them. But after we report upon them and recommend them, it must prove a long time before they come into general cultivation. We should be very careful in extending our list of varieties; but what is the value of this committee, unless we are able to give the varieties that appear to have special merit a further trial? What I would suggest is that in sections where such seedlings come from, and where they are considered to be of value for the district, the committee should have some way of having them tested in the climate where they originated, say at the local experiment stations.

Mr. Smith : While the work of the experiment stations is extremely useful, I agree that it could be made of even more use to the country if thorough and exhaustive experiments were made with the common kinds of peaches, plums and other fruits. In peaches, what we need principally in Canada is a peach that will ship a long distance. We have practically only one such peach coming in the heart of the peach season, the Elberta. Our markets are bound to be at long distances. The great market of the future will be the Northwest. We are, therefore, in particular need of a good shipping peach, even apart from the question of shipping to the old country. We want an Elberta peach a week earlier, and another a week later. There may be such peaches.

Prof. Hrtt : We tried two years ago to do just as has been suggested—to get from the American nurserymen samples of the varieties they were introducing. I sent out circulars to these men asking them to send samples. In reply we received only one sample.

Mr. Morris : Would it not be well to have delegates appointed to the different fruit conventions on the other side? A great deal of information could be obtained in that way as to new varieties.

Mr. McNeill: I wish to point to a few mistakes that have been made in our experimental work. I think there is a lack of careful discrimination in the varieties experimented with. We should not select varieties indiscriminately from the nurserymen's catalogues. We have loaded up our experimenters with useless varieties in this way, varieties that should not have been imposed upon them.



Showing Some of Dr. Saunders' Hybrids from *Pyrus Baccata*.

A GENERAL VIEW OF THE WORK OF THE ONTARIO FRUIT STATIONS.

By L. Woolverton, Grimsby, Secretary.

It was at the meeting of the Ontario Fruit Growers' Association at Peterboro', in December, 1893, that a committee, consisting of Messrs. John Craig, of Ottawa, Alex. McNeill, of Windsor, and W. W. Hilborn, of Leamington, was appointed to devise a practical scheme for experimental horticulture. The following are some extracts from the report of that committee as presented to the Hon. Minister of Agriculture in 1894:

"The exhibits of fruit made by Ontario at the World's Columbian Exposition gave to the world a truer conception of the possibilities and attainments of the Province. It also inspired the fruit growers of the Province with a better appreciation of the capabilities of her soil and climate for the production of fruit—that "flower of commodities"—in its highest state of excellence. It has also emphasized in a general way the fact that each variety of fruit varies in respect to appearance and quality according to the soil and locality in which it is produced, and has a more or less certain area in which it reaches most nearly perfect development.

"Our knowledge of the varieties in habit of growth and quality of the fruit, due to soil or climatic effects, is vague and undefined, and data with regard to the relative success of varieties in different sections is lacking. The fruit interests of the Province suffer in consequence.

"The Fruit Growers' Association has long recognized the advantage that would result from establishing a system of experiment stations, particularly designed to collect information of this character, and to promote the fruit interests of this Province generally.

"It is believed that the fruit interests of the Province cannot be served best by the establishment of a single experiment station, no matter where it might be located, and, further, that results more useful and more immediately available would be obtained by the establishment of a number of small and inexpensive trial experiment stations. These might be carried on in co-operation with the various fruit growers in different parts of the Province who already are specialists, and have made a financial success of growing one or more classes of fruit. For example, the services of a grape specialist, or a plum or peach grower, might be secured, with all the advantages accruing from knowledge gained by practical experience."

A grant of only \$2,600 a year was asked for the prosecution of this work, which was this year, 1903, increased to \$3,200, a very small sum in consideration of the work accomplished.

Our aim during these ten years has been to have all fruits, new and old, so tested in various parts of our Province that we could in time give reliable advice to intending planters regarding the kinds best suited to the various sections, and also as to the varieties most profitable for both home and foreign markets.

Hitherto the travelling tree agent has been almost the only authority, and his knowledge is usually limited by his gorgeously-colored fruit plates, which often grossly misrepresent the varieties. The tenderest varieties of apples have been sold to farmers along the northern shore of Georgian Bay, according to our experimenter in St. Joseph Island, while plums and cherries, and even peaches, have been sold in other northern districts, where nothing but disappointment and loss of money is sure to result.

Now we have fourteen stations, so disposed as to fairly well cover the Province, and each of these has been given several hundred varieties of fruit to be tested and reported upon. Your Secretary has about 800 varieties under test in the Niagara district, and has about five acres of ground occupied in his experimental plot; Mr. Hilborn, in Essex, about five acres, with about 250 varieties; Mr. Peart, at Burlington, 1 1-2 acres, and 214 varieties; Mr. Mitchell, in the Georgian Bay district, 5

acres and 200 varieties; Mr. Sherrington, in the Lake Huron district, 4 acres and 100 varieties; Mr. Jones, in the St. Lawrence district, 5 acres and about 200 varieties; Mr. Pettit, in Wentworth, about 3 acres and 200 varieties; Mr. Huggard, in Ontario County, 5 acres and 400 varieties; besides which we have our strawberry and gooseberry stations, and our stations for testing the most hardy fruits in Algoma and Wabigoon.

Just now we have under consideration the establishment of a station near New Liskard to find out what fruits might be wisely planted by the many farmers who are taking up land in that promising district.

For some years the writer has been experimenting in another line, at his own risk, which may prove quite as important to the fruit industry of the Province as the testing of varieties. It is the export of the product to those distant markets where it is most in demand. So far we have not attained the success hoped for when the ocean cold storage for fruit was installed.

That peaches, Bartlett and Clapp's Favorite pears, Astrachan and Duchess apples would be most remunerative to us, if we could lay them down in perfect condition in London, Liverpool, Manchester, is proven by the exceptional prices received by the writer for stock which arrived in first-class condition. For example, on the 18th of September last, I had 162 cases (25 pounds each) of choice Bartlett pears sold in Glasgow at 8 shillings, or \$1.92 each, or at the rate of about \$14 a barrel! In that consignment were nine boxes of Boussock, and these sold for 7 shillings 3 pence, or about \$1.75 a half-bushel box. On a former occasion I had some peaches carried over in a good condition, and they were sold at the rate of about \$4 a bushel.

Now, these sales are sufficient to show the possibilities before us, could we only land our fruit in good condition. But alas! we cannot depend upon any given temperature being held for us on car or steamer from start to finish.

Surely here is a field for a great enterprise, if some steamship company could be induced to give us a temperature of, say, 33 degrees Fahrenheit for fruit for the whole voyage.

Another very important department of our work, the responsibility of which has fallen upon your humble servant, the Secretary of the Board of Control, is the description and illustration of the fruits of Ontario. The object of this work is to place in some concise and permanent form for easy reference, a technical description of each fruit, including all that is known of its history, absolute value and special adaptation. For this latter part of the work, the tests made at the various stations are essential, and, to carry out the scheme in full, there ought to be tested at each station all varieties of fruit that have absolute value, in order to know just where they may be successfully grown. Criticism upon this work is invited, in order that we may arrive as nearly as possible at a perfectly correct description of each fruit.

At the request of the Board, the Secretary has been asked to add to his work the testing of all varieties of cherries, because of the already large collection of that fruit at Maplehurst.

GRAPES.

By Murray Pettit, Winona.

Last year I discussed the newer varieties of grapes; this year I think it would be interesting to refer to some of the old standard varieties and what they have done with me. My first vineyard has been fruiting for thirty years. It was planted largely with Concord and Delaware. The Delawares average me two and a half tons to the acre, and net about \$70 a ton. They require more labor or more expense in picking than some others, as we go over them twice a week from the time they commence to ripen. If you leave them till all are ripe, those that ripen earlier will burst. The

price, too, is usually better as soon as they commence to ripen. There is a good profit in Delawares, planted on rich land and properly pruned. Do not attempt to grow them on the arm system or any system where you have to carry old wood. My plan is to renew from the ground. If you prune closely, they will throw out suckers from near the root. Then we spur prune a few of the suckers every year and get bearing wood for next season's fruit.

I also planted some Champions in that vineyard. The first that I shipped to Toronto twenty years ago sold at sixteen cents per pound. They have sold at paying prices ever since. But I would not recommend planting great quantities of the Champion. There is a great demand for a grape at the time the Champion ripens, and if we had as good a grape as the Concord to put on the market at that time, the market would take very great quantities.

In the spring of 1882 I planted 300 Niagaras, and in the fall of 1885 I sold from them \$8.55 worth of grapes. That vineyard has borne regular crops ever since. In the spring of 1886 I planted 500 Niagaras. That vineyard has not had one pound of fertilizer since it was planted and has borne good regular crops. This year's pick amounted to 1,633 nine-pound baskets, for which I received over \$300 for a little more than an acre.

The Lindley has also been a profitable grape, planted alternately with some strong fertilizing variety. In that way we get a better crop. The Agawam and the Catawba have also borne good regular crops, and have sold at good prices with me.

I referred last year to the packing, stating that too many mildewed, unripe grapes were put on the market, and also too many bruised and mouldy grapes. Both the growers and the railway companies are largely responsible for this. Many growers do not sulphur their vineyards. It is a very trifling expense when the grapes are small to go through the vineyards and throw sulphur into the vines. It should be done when the weather is still and a little moist. Walk down the row and throw the sulphur into the centre of the vine near the bottom wire. It is sufficient to throw in the sulphur from one side only and not from both. That will keep the vines free from mildew.

It does seem too bad that so many green grapes are put on the market and more care should be taken in this respect.

Very few growers have any idea of the condition their fruit is in when it reaches the consumer—picked by cheap help, thrown into the baskets, and then bumped and bruised on the railways. If they could see it after a few days of such treatment, they would not want to own it.

Q.: How much sulphur would you use on the vines?

Mr. Pettit: About a tablespoonful to each. Where there has been a great deal of mildew, throw it in from both sides of the row.

Q.: What variety is most subject to mildew?

Mr. Pettit: The Rogers.

Q.: What about the Brighton?

Mr. Pettit: Yes; it is subject to mildew, but we do not grow it much for market.

Q.: Have you fruited Campbell's Early?

Mr. Pettit: It is the most promising new grape I have tested.

Q.: Does not the placing of so many Champions on the market early in the season affect the sale of the good blue varieties later on by prejudicing the consumer against grapes of that color?

Mr. Pettit: Yes; there is no doubt there is a point there; but if a man can make good prices on Champions, there is a great temptation to do so.

Q.: Do you sift the sulphur? I find that one bag that is sifted will go as far as two that is not.

Mr. Pettit: You are quite right.

Q.: What about rot?

Mr. Pettit: I have not had much trouble with rot.

Q.: How do you treat black rot?

Mr. Pettit: I have not had much experience with it. Bordeaux Mixture is the proper remedy.

Q.: We suffer very seriously from black rot in this district.

Q.: What soil do you recommend?

Mr. Pettit: Grapes will thrive in almost any soil. I recommend a deep soil not too rich.

Q.: What are the best of the Rogers varieties?

Mr. Pettit: Lindley is one of the best, but is not as productive as the Agawam.

Q.: If you were planting a vineyard now, what varieties would you put in?

Mr. Pettit: I would plant some Campbell's Early, Worden, Lindley, Concord, Niagara and Agawam. Where grapes ripen very early, that is, on heavy, dry soil, there is some money in Champions, but if they are planted on a deep, moist soil, they are very sour. In localities where the Catawba ripens, I would plant it. Vergennes is another good grape, but no better than Rogers 15.

Q.: What proportion of Concords and Niagaras would you put in?

Mr. Pettit: Nearly two-thirds of these two varieties.

Q.: In equal quantities?

Mr. Pettit: Yes. The difficulty with the Niagara is that so many are sent to market but half ripe, which is due to the grower trying to get early prices. Another cause is that growers do not prune them close enough and allow the vines to bear too heavily, and the grapes are very poor in flavor.

Q.: In our locality grapes grown on clay are considered to make better wine, being sweeter.

Mr. Smith: We have not got a good grape in Canada; there is immense room for improvement. My suggestion is that the men who experiment with grapes or some of the experimenters should sow seed on an enormous scale and make a very exhaustive and thorough attempt to secure a really good grape.

Q.: What is the matter with Catawba?

Mr. Smith: It is too late.

Q.: The Concord?

Mr. Smith: It bruises, and is, therefore, a poor shipper. A quarter of the berries are cracked and get mouldy in the basket.

Professor Fletcher: With regard to black rot, Bordeaux Mixture is the best remedy. Mix 1 pound of copper sulphate with 24 gallons of water. Spray this on before the buds burst, and follow this with Bordeaux Mixture. Bordeaux Mixture may be cleaned from the grapes by dipping them in vinegar and water.

CURRENTS AND BLACKBERRIES.

By A. W. Peart, Burlington.

So far as currants are concerned, my experience is that the acreage devoted to this crop in this Province is about large enough for present requirements. I do not think I grow any fruit that pays me as poorly, and I grow all the fruits except strawberries. However, the question is as to the best varieties. I have found in my experience that there is no fruit that responds more quickly to good treatment than the currant. It will stand a good deal of neglect, but if we want large currants and productive bushes, we must take good care of them.

In planting currants, there is some variation in the size of the bushes, but the average distance apart is six feet each way, which will give 1,200 bushes to the acre. Do the planting deeply. Growers do not, as a rule, plant currants deeply enough; and this is true of other fruits as well. I aim to plant the trees a little deeper than they

were in the nursery, as indicated by the sand line at the base of the trunk. I also believe in root pruning. When the bushes and trees come to us from the nursery, the ends of the roots are often bruised and torn. That portion of the root should be cut off with a clean under oblique cut, so that it will impact closely with the soil. I have pulled up trees two or three months after planting and found that the ends of the roots, where cut, had thrown out a soft granular formation, through which were protruding tiny rootlets. I make this a practice with all roots and trees except blackberries and raspberries.

In regard to cultivating: I plow my currants in the fall, and cultivate in the spring. I do not cultivate after the middle of July, as it is apt to promote late fall growth, and to make the plant tender.

In regard to pruning red currants, these bear the bulk of the fruit on spurs two years old and upwards. My practice is to thin out the old wood, leaving six or eight main branches, and cutting back the more vigorous shoots. I do not cut back to a single stem or trunk, tree fashion, for if I did, in our district I should probably lose many of the bushes from the currant borer. If, on the other hand, I prune so as to develop a bush growth, if one branch is attacked, I still have a currant bush left.

In regard to varieties: I do not think I have experimented long enough to be positive or definite on this subject. There are four or five varieties which I like very much. Of these, among red currants, I would still plant the Cherry. It is as good a currant and as profitable commercially as any I grow. I would plant a few Fay's Prolific, but it is not as productive with me as the Cherry. I am a great believer in the Wilder, which is one of the new varieties. It is as large as the Cherry—three-eighths to half an inch in diameter—hangs well on the bushes, is very productive, and of fine quality. It is slightly later than the Cherry.

Another variety that is promising well is the Pomona. I think it has the highest quality of any red currant I have. It is fairly productive, is a vigorous grower, and is promising well.

Q.: What would you consider the best commercial red currant in your experience?

Mr. Peart: If I were planting, I would plant largely of Cherry and Wilder, and also some of the Old Red Victoria. I would not plant white currants for commercial purposes, as they do not bring the price.

Mr. Macoun: We have 110 varieties on test at the Experimental Farm, and I would recommend the three that Mr. Peart has mentioned, but I place the Wilder first.

Mr. Peart: Black currants bear chiefly on wood of the previous year's growth. My method of pruning is to prune in the spring. Thin out the old wood and do not cut back the young wood to any extent. The tendency is not to prune out enough wood, and the consequence is that a great deal of the fruit is small.

Q.: Will you name the best varieties of black currants?

Mr. Peart: The Naples, Saunders, Collins' Prolific.

Mr. Macoun: Would an early black currant be profitable? Would there be any place for it?

Mr. Peart: I do not see any object in it. I think that as the season advances I get a better price for black currants.

Q.: Why do you reject Lee's Prolific?

Mr. Peart: It is not so productive with me; it seems to require especial care.

In the Burlington district, blackberries do best on a sandy or gravelly loam with a quicksand bottom. I make the rows seven feet apart, and the plants from two to three feet apart in the row. In regard to pruning, I go through them about the first week in July and cut back the young suckers from two and a half feet to three and a half feet from the ground. I do this to make the plants more vigorous and stocky so as to resist high winds. I then prune again in March, cutting off the laterals, leaving a foot to two feet, according to the variety.

Q.: Can you give us the length of laterals according to variety, roughly?

Mr. Peart: With the Taylor, the Kittatinny and the Agawam, the laterals should be left long. The Snyder, Western Triumph, and Lovett should be pruned shorter. The Hackberry that is grown most extensively in my district, and makes the most money, is the Snyder. It is a moderately vigorous grower and thoroughly hardy.

Q.: Have you tried the Eldorado?

Mr. Peart: Yes; it is a light cropper, of good quality.

Mr. Sherrington: It is a heavy cropper with me.

Mr. Peart: If I were setting out a plantation, I would plant the Snider, Agawam, some Western Triumph, and some Kittatinny.

Q.: What about the Gainer?

Mr. Peart: Very promising; the only reason I have left it out is, that I have tried it only four or five years. It is productive and an exceptionally large berry. The Ohmer is promising well, is large, hardy, productive and of good quality.

Q.: What about the Ancient Briton?

Mr. Peart: It has shown signs of tenderness, is only of medium size and relatively unproductive.

APPLES AND CHERRIES.

By G. C. Caston, Craighurst.

I think there is a possibility that some varieties of apples are gradually adapting themselves to climatic conditions, as I observe that varieties which were tender twenty years ago in our district seem perfectly hardy to-day. There are too many varieties in this country from a commercial standpoint, and we should be very careful about recommending new ones unless they have particular merit. Even though they may promise well to start with, sometimes a tree will flourish well for a number of years and then begin to fail. This is particularly the case with the plum. On the other hand, sometimes, the older the tree, the better fruit it will bear.

If you asked me what I considered the best commercial apple in Canada, I would say the Northern Spy. It is the apple that is wanted in our own local market and also in the northern States of the Union. It has the quality to recommend it, either for cooking or dessert. In the Northwest and in New Ontario the men who deal in apples all want the Spy. One of the principal objections to it is that it takes so long before bearing—anywhere from 13 to 17 years before it comes into full bearing. It is also inclined to rot in the trunk. The wet gets into the crotches and the tree falls apart. This is remedied by top-grafting, but the principal point in top grafting is that we get the fruit much earlier.

Q.: How far up the tree would you top graft?

Mr. Caston: In the limbs. As soon as the tree is large enough for cleft grafting, you can begin to top graft. The new top should not be worked on all at once, but by degrees.

In late winter apples, Cooper's Market is said to keep even longer than the Ben Davis. I do not know how it is as a bearer, as I have not had long enough experience with it yet, but I think it is a very promising variety. It is of better quality than the Ben Davis. Another variety that will keep as well as the Ben Davis is the Salome. It grows to a fair size, is a nice cooker, an excellent keeper, and of fair quality.

The Gano resembles the Ben Davis, but it is decidedly superior to it. It is just as long a keeper, a better cooker. I planted two trees in 1895 which yielded two barrels each of first-class apples this year. If apples of the Ben Davis type are to continue to be good market apples, I would recommend the Gano in preference to the Ben Davis.

Mr. McNeill: In the Cobourg district they were planted quite extensively, and they would just as soon have the Ben Davis.

Mr. Caston: The Windsor Chief is an excellent apple for sections where they cannot grow the Northern Spy. Possibly it will fill the bill as a good winter apple. It seems to be clean and hardy, and very promising. The Mann is also a very good apple, but it is inclined to be tender, and would be better for top grafting. It will keep till May.

The Ontario is a cross between the Northern Spy and the Wagener, and has some of the characteristics of both. With us it is one of the most promising apples. The tree partakes a little of the nature of the Wagener, being rather scraggy in the trunk. I think it would be better top grafted. It is an early and abundant bearer; is clean, free from scab, and while it does not come up to either of its parents in quality, it is an excellent apple and a good cooker, and will keep till May.

Mr. Thos. Beall: It is a far better cooking apple than the Spy.

Mr. Caston: In my opinion there is nothing better for cooking than the Spy.

Mr. Smith: If you were planting a permanent orchard, is there anything better to plant as a filler.

Mr. Caston: I do not know of anything better.

Mr. McNeill: Apple packers have not spoken highly of the Ontario. They say it is not a variety that they can ship with confidence during the later winter months.

Mr. Caston: With us it is an excellent keeper, but, of course, we do not store apples.

Mr. McNeill: Then you are scarcely in a position to judge?

Mr. Caston: Of course, the packers look for the Ben Davis and Coopers.

Mr. Beall: That apple will keep first-class till the middle of June.

Mr. Caston: That is our experience in a small way, and we can get nothing better for the Northwest trade.

Where you cannot grow the Rhode Island Greening, the Northwest Greening will take its place in the northern home market. It is a fairly good dessert apple, and a good keeper. The Stark does not begin to bear early, like the Ontario, which will pay for itself before the Stark begins. I am favorably impressed with that apple in our section, and think it will succeed over the greater part of the Province. It is a fine, healthy growing tree, and is one of the commercial sorts that can fairly be recommended. It is not of very high quality, and is not very well colored, but is a fairly good apple.

Possibly there is no old well-known variety in the country whose seedlings grow to resemble itself as much as the Snow. The Shiawassee Beauty is a seedling of the Snow. It has the advantage of being clean, which makes it a great exception to most of the Fameuse varieties.

In fall apples, the Peerless is early bearing, but I do not know whether it is prolific. It is a slow-growing tree, but very hardy. The fruit is always clean, and of a very handsome color. I think it should capture the old country market at that particular time of year, and that it is worthy of trial.

Cherries. The nearer you are to large bodies of water, the better will cherries succeed. In Russian varieties, the best I have experimented with is Oral No. 24. The fruit is very dark, and of better quality than the Ostheim. Oral 25 is said to be still hardier in the bud.

APPLES.

By Harold Jones, Maitland.

Many of the varieties referred to by the last two speakers I have at my station. Among the most promising of those mentioned with me is the Northwest Greening. It grows a little larger with me than with Mr. Caston. The tree I have was planted

in 1897, and this year yielded about 2 1-2 bushels of fruit. The most promising of all the new varieties we have so far is the Milwaukee. It is a seedling of the Duchess, and originated in Wisconsin, and the character of the tree is very similar. It is a business tree right from the start; requires little pruning, bears young, and bears annually, and the only defect it has is that, being a heavy apple, it is a little inclined to drop in September, but is not nearly as bad in that respect as the Pewaukee. I have kept it until April in perfect condition. I consider it a good, all round apple, and with me it stands first among the new varieties.

Of the other varieties mentioned, the following have proved undesirable with me, namely: Salome, Winesap, Roman Stem, Sutton's Beauty, and the Mann, which sunscalds badly.

Q.: What do you think of the Ontario?

Mr Jones: It is subject to canker and frost injury to a large extent. It is going to be short-lived, and possibly I should have put it in the undesirable class. I have 160 or 170 trees. They are beginning young, and next year we shall have quite a crop on trees four years planted; but they are going to break off and be short-lived, and the orchard will be a wreck at the time it ought to be in full bearing.

I think the reports from experimenters would be more valuable to those living in the locality, and to the Province at large, if we were to give a list of the most profitable varieties for the district from the commercial point of view. In the St. Lawrence valley, for instance, the Fameuse group is undoubtedly the most profitable. We can grow these apples to greater perfection than in any other section of the Province, and we should recognize that. They will give us more money, tree for tree, for the fall market, that is, from September till the end of November, than any other variety, yielding as high as twelve barrels to the tree on 22-year-old trees, and they will sell for nearly as much money per barrel on the open market as the Spy. I have kept a close record of my orchard of Fameuse since 1894, just to find out what an orchard will give for a succession of years. Taking an average for eight years, it has netted me clear of the expense of the barrels, \$200 per acre. I do not know of any other one variety put in a block of four acres, that will give such money on an average. One year it gave me \$1,296. There are other apples of the same class doing equally as well with us, bearing heavily and annually, and selling equally well, namely, the McIntosh Red and Scarlet Pippin. The McIntosh Red is decidedly a box apple with us, and in that way will go to England in good condition. This fall we shipped them to Winnipeg in capital condition, and there has been a sharp demand for it. The Scarlet Pippin will stand the barrel trade better. It is inclined to over-bear as it gets age, and then the fruit is sometimes small. The McIntosh Red does not give as heavy crops with us as either the Snow or Scarlet Pippin. These are the leading early winter apples of our section. Wealthy is a desirable variety, but does not attain the same high colorings and size that it does in the Ottawa Valley.

For late winter apples we are not so well off. The best and most paying varieties we have for that season are the Golden Russet and Scott's Winter, which is of fair size, from two to two and a half inches. It has a sharp, acid flavor, bright color, keeps till May, and is in good demand all the time as a cooker. A cooker seems to have a more constant and general demand than a table apple. Closely following this is the Canada Red. It is rather inferior in quality, but keeps well. Before 20 years of age, however, the tree is decidedly unprofitable, but bears fair crops, when it gets age. It is bright red in color, thickly dotted.

The Seek is also a valuable apple with us, but is inclined to over-bear and run small, and has not the bright color of the others. The Winter St. Lawrence keeps well with us, and is a promising variety; so is the Canada Baldwin. We can grow Northern Spies, Baldwins, Kings, and apples of that class top grafted, but we cannot grow them so well as the Snow and the McIntosh.

RASPBERRIES.

By A. E. Sherrington, Walkerton.

The earliest raspberry we have for local use is the Reliance, but it is rather soft for shipping. It is a fairly vigorous grower and of very good quality. It is ripe by July 1st, and can be picked till August 1st. The Turner is similar, but a little firmer, and I do not know of any variety that will give better satisfaction for the table. The London is an excellent berry, but is neither as firm nor as vigorous as it might be. It is very slow filling up in the row. I grow my raspberries under the hedge-row system, planting the rows six feet apart, and allowing them to grow up like a hedge. The Cuthbert is not tender with us, and is the queen of all raspberries. It is a rank grower, and the fruit is firm, and of good color, size and quality. It brings from one to two cents more than any other variety. The Phoenix is an excellent berry with us, but not as vigorous as the Cuthbert. It is very productive, more so than the Cuthbert, and the fruit is nearly as large, but not quite as firm.

In Blackcaps I can recommend Hilborn, Conrath, Older, and Smith's Giant. The Hilborn is perfectly hardy with us, and a good cropper. The Conrath is a little earlier. It is a very rank grower, and the fruit is large and of first-class quality. The Older is doing well, but the plants are of rather straggling growth, and have to be well pruned. The Smith's Giant has been doing well, but is a little tender. It is a very strong grower, and has a very large berry of good quality. It is a late variety.

In the light-colored varieties I have only one which has given any satisfaction, and that is the Golden Queen; but there is no market for these varieties with us. In purple varieties the Schaffer is too tender with us, and the Columbia slightly tender. We do not find this color profitable in the market. Schaffer is excellent for home use, especially for canning. There is a growing demand for blackcaps. A few years ago it was hard to find sale for them, but now I can hardly grow sufficient. They are an excellent berry for canning, and people are beginning to appreciate them. Personally, I think they are one of our richest fruits.

Q.: Do you mulch?

Mr. Sherrington: I have not done so for the last two or three years. Our practice used to be to draw straw to the patch and cover the ground just as the fruit commenced to ripen. This mulch held the moisture, and kept the fruit clean and free from sand. But it has this fault: it induces the roots to come too near the surface, and we have discontinued it on that account. We now draw in well-rotted barnyard manure, and scatter it over the surface in the fall, and cultivate in the spring.

Q.: Where do you classify the Craig?

A.: It is tender with us, and has not sufficient constitution.

CULTIVATION.

Raspberries are planted in rows six feet apart, and the rows about thirty inches wide, like a hedge; shallow cultivation is practiced, that is, they are kept clean by frequent and shallow cultivation. For fertilizing, well-rotted manure is spread over the entire ground in the fall; wood ashes is applied at the rate of forty or fifty bushels per acre every alternate year. The pruning is done by cutting out all the old and weak canes either in the fall or spring, and all fruiting canes of strong growing varieties have eight or ten inches of the late growth removed in the early spring. By this method we get a better quality of fruit. Blackcaps are planted in rows six feet apart and three feet in the row, and are cultivated the same as the red ones. The pruning of the blackcaps is done by pinching off two or three inches of the young canes when about twenty or twenty-four inches high. This causes them to throw out their laterals near the ground, making a strong plant. The laterals require but shallow cultivation should be practised, so as to retain the moisture which are cut back in the following spring to about twenty to twenty-four inches. Frequent cultivation is necessary in the growing of raspberries.

STRAWBERRIES.

By E. B. Stevenson, Jordan.

I believe there is nothing more important in strawberry growing than a careful preparation of the soil, if you wish to be successful. There is no fruit that is more unsatisfactory and more unprofitable when neglected, and no fruit that will more readily respond to good care. None but those who know what the strawberry can produce under proper conditions can be made to believe what you can get off an acre of strawberries. I believe that the up-to-date grower, who gives the strawberry all the favorable conditions, will clear one year with another from \$225 to \$275 per acre; in some years they will produce even more. Last year I gave some specific instances of this.

The best early variety in the neighborhood of Jordan is the Michael, but strange to say, it is not successful anywhere else that I know of. Other good early varieties are the Van Deman, Johnson's Early, and the Beder Wood. Next in rotation is the Clyde. In the early new varieties the Monitor has done well. It is a large bright, clean berry, a heavy cropper, and firm. Also the Palmer's Early.

Q.: What is the season of the Monitor?

Mr. Stevenson: Early to medium; it is a mid-season berry. I should also mention the Haverland, and Tennessee Prolific. The Tennessee Prolific is one of the best market berries grown, and it is not as extensively grown as it deserves to be. It is a large berry. Next come the Saunders and the Williams. The latter is not as good as the Saunders. It is largely grown in the Jordan section, and shipped to Manitoba and the Northwest. They pick it too green in my opinion. The berries will color a little on the top while it is hard, and they are picked and shipped to Manitoba in that condition. It arrives firm, because it is not ripe.

Q.: I doubt if you could get them through if you allowed them to ripen.

Prof. Hutt: We have shipped ripe strawberries to Winnipeg all right.

Dr. McCullough, Blenheim: I picked some for the local market two days before they were ripe, and they arrived in prime condition.

Mr. Stevenson: That, I think, is the point; they must not be picked too green, or they will shrivel; they should be all colored but the small green tip.

Among the new varieties I would mention the Lyon as very promising, the Success and the Mrs. Fisher, which is one of the largest we have ever had, and seems most promising. Parson's Beauty is a good market berry among the older varieties; it is a good cropper, and very high in color.

Among the late varieties I would recommend the Gandy, Joe, and Aroma, and among the very late varieties, the Nettie, and the Timbrel No. 18.

Q.: What is the value of the Nick Ohmer?

Mr. Stevenson: It is very tender, and the blossoms and buds are killed by the frost.

Q.: Does the Clyde grow plenty of plant to cover the berries?

Mr. Stevenson: Yes, with cultivation. The Clyde is weakening now to what it was ten years ago.

Q.: Have you any strawberry that will yield as much as the Williams and give as fine a berry?

Mr. Stevenson: The Saunders.

Q.: Do you think the Clyde a good shipper?

Mr. Stevenson: No, I do not, for distant market. All right for near market.

Q.: What about the Irene?

A.: It is a very good late berry.

Q.: Miner's Prolific?

A.: It was dropped years ago.

Q.: The Semple?

A.: Very good, but it has an imperfect blossom. The berry is very fine, handsome and firm, and the variety is productive.

I want to announce to the Association that we have at last got the perfect strawberry. It is called the Cardinal. I have a letter from Mr. Streater, of Ohio, where it originated, in which he states as follows: "I shall be glad to send you plants of the Cardinal for testing. . . . It has been examined by four expert judges of the American Pomological Society, and their expressed opinion is of such high character that no one need fear to send it for test. Until a few weeks ago it has not been sent from this place. . . . The Cardinal as a market strawberry far surpasses any variety I ever knew in all essential particulars; I have not found a weak point in it."

Mr. Crawford, who is called the Strawberry King of Ohio, saw the Cardinal growing on the grounds of Mr. Streater last June, and after he had returned home said he had lost interest in nearly all other varieties.

PEACHES.

By W. W. Hilborn, Leamington.

Among the great number of new varieties of peaches which I have tested very few are any improvement on the older ones. What has been said about apples is true of peaches; we have too many varieties, and among new sorts should select only those that show a decided improvement. However, in peaches, no kind will cover more than a few days, and therefore we should have good varieties extending over a period of nearly three months. At present we have not got enough good varieties to do this. Among the early sorts we have none that are good shippers, and there is great need of further experiments in that direction.

Among the newer varieties worthy of consideration is the Queenboro'. It is one of the earliest, but it is not an ideal market peach, yet it has a place to a certain extent. Next is the Triumph, which is the first yellow peach that ripens with us. When properly grown, it is a fine peach, and crops well, and the fruit is large, while the trees are young; but the fruit rots badly, and for that reason it is not a profitable market variety. The Brigden is a peach of the Crawford type, which has proved profitable. With us it is as good if not better than the Early Crawford; it is fully as large and perhaps a day or two earlier. It is a yellow peach and is said to be the same as the Garfield.

Q.: What about the Admiral Dewey?

Mr. Hilborn: It has not fruited sufficiently for me to offer an opinion. The New Prolific is proving profitable on sandy soils. The Engle Mammoth is one of the best market peaches we have. It is as large as the Crawford and is hardier and the fruit is a better shipper. I think it is more nearly an ideal shipper than any mid-season peach except the Elberta.

Q.: Are you giving these in the order in which they ripen?

Mr. Hilborn: Yes. Of those that have so far been well tested here, I consider the Engle Mammoth the most valuable of all the new varieties.

The Bronson is more of the Golden Drop type, but a little larger. It is a yellow peach of little color, but hardy and of good size. The Kalamazoo is another of the same type, but it is a few days later. The Banner is a local variety which promised well, but has been rather disappointing. It has been planted largely, and early in its history it produced some fine fruit, but last year and the year before, it was disappointing to many. This year the fruit was of good size and of fine quality, and I think will stand shipping equally with the Smock. It ripens in advance of the Smock, and has better color and better quality, and the trees bear young and very heavily. The Lawrence is the latest of anything we can ripen here. It is not quite large enough, but the fruit is of good color and quality and fair size.

Q.: Is it superior to the Salway?

Mr. Hilborn: It is freer from spots, and, if anything, of better form. It is about the same size as Salway; perhaps not quite as large.

Leaving out the early clingstones, the varieties I would recommend for early planting are as follows: Yellow St. John, Garfield, Early Crawford, Fitzgerald, Engle Mammoth, New Prolific, Elberta, Bronson, Kalamazoo, Late Crawford, Banner, Smock, Salway.

Q.: What about the Lemon Free?

Mr. Hilborn: It has shown a tendency to drop its fruit.

Q.: Would you recommend planting any of the smaller varieties that have not much color?

Mr. Hilborn: Yes, for the reason that we want something to cover the entire season. Another reason is that these varieties are a little hardier in fruit bud, and will give fruit in years when some of the finer sorts will not, and we want fruit every year. Besides that, they are among the finest canning peaches we have.

Q.: How do you class Steven's Rare Ripe?

Mr. Hilborn: It is one of the best shippers we have among the white varieties, and a fine peach when properly grown, but if not properly grown the fruit does not color properly.

Q.: Is the Champion a clingstone?

Mr. Hilborn: Yes, the Champion we have here.

Mr. A. M. Smith: I got it from the originator in Ohio, and it is the finest white-fleshed peach we have. The genuine Champion is a freestone.

PREPARING LIME, SALT AND SULPHUR MIXTURE.

I procured a small steam boiler (one made for steaming hog feed) and two coal oil barrels. Fill one barrel with water, turn in the steam, when hot put steam pipe in barrel No. 2, in which four or five pails of water has been placed, when this water has been heated to nearly the boiling point add 15 lbs. fresh lump stone lime, stir constantly while slaking. As soon as possible add 15 lbs. sulphur, rubbing it through a sieve and stir thoroughly. It is best at this time to add five or six pails of hot water from barrel No. 1; boil one hour, add 10 lbs. salt, boil 15 minutes longer, then strain into the spraying barrel and add sufficient hot water from barrel No. 1 to fill the barrel and apply as soon as possible, while hot. Never make up this preparation until ready to use it.

Q.: Do you slake your lime in hot water?

A.: Yes, and get the sulphur in as soon as possible, and then boil for one hour. I boil for an hour to make sure, and then add the salt and boil for fifteen minutes longer. Three of us were able to prepare and apply five barrels per day.

Q.: Do you apply hot?

A.: Yes; just as soon as possible, while hot.

Q.: Do you strain the lime?

A.: Yes; after it is boiled. I strain it through an ordinary sack.

Q.: Does the lint off the sack get into the pump?

A.: Yes sometimes.

Mr. Tweddle: Why not use a brass strainer?

Mr. Hilborn: Yes, but it seems to clog.

Mr. Tweddle: If you do not allow it to dry it will not clog.

Q.: What is the idea of boiling the lime and sulphur for so long?

Mr. Hilborn: That is the direction, and I suppose it is to insure thorough boiling. As soon as you have one batch of material prepared and put into the pump barrel, you want to start in on the next batch. It makes quite a difference how you put the sulphur into the mixture; do not dump it in in lumps, but stir in slowly, and it will dissolve more rapidly.

Q.: Did you ever try putting the sulphur in first and then adding the lime?

A.: I never tried it.

Q.: Do you use flour of sulphur or rolled brimstone?

A.: The ordinary flour of sulphur.

Q.: Do you notice any change taking place in the color of the mixture when the sulphur is dissolving?

A.: Yes, the change takes place after boiling for about half an hour.

Dr. Jas. Mills: Mr. Fisher said that he tried all possible times, and that it seemed necessary to boil for the time stated.

Q.: In addition to checking the scale, does it do any other good?

Mr. Hilborn: I think it does. I think that the general cleaning up it gives the trees pays amply for the work involved. In the block I sprayed for the scale there were a few Smock trees. The fruit on them was perfect, and colored up better and was finer in every respect than the fruit of other trees of the same variety elsewhere that did not receive the treatment. I also sprayed my cherry trees, and my opinion is that the aphid was checked very considerably by the use of this solution.

Q.: Is there any mixture that does not require boiling and which could be more easily prepared?

A.: If I knew of one, I would use it.

Mr. Bunting: We have had a mixture on trial in our section which appears to give good results, but I would not discard lime and sulphur for it until we have had more experience with the new one. We are hoping that this solution may prove just as effective; if so, it is very easily prepared and applied.

Q.: Will the lime and sulphur solution injure the leaves after they come out?

Mr. Hilborn: Yes, and leaves that are touched with it are in many cases destroyed.

Q.: How would this spray affect the curl leaf?

Mr. Hilborn: I think it is a valuable remedy for curl leaf, just as good as Bordeaux mixture; in fact, as a general fungicide I think it is equal to the Bordeaux mixture. Of course, it cannot be applied after the foliage comes out.

EAST CENTRAL FRUIT STATION.

By R. L. Huggard, Whitby.

We have had a very favorable season for the development of our various fruits at this station, not only in wood growth, but the fruit crop as well. Out of some 88 varieties of pears that fruited with me I have found only about ten or twelve new varieties that equalled or excelled many of the older varieties.

Our system of cultivation for the last two seasons especially has been to have all the pruning done by the middle of April. We spray with Blue Stone about the last of March and then with full Bordeaux mixture, just as the buds are swelling (I think this is the most beneficial spraying of the season). Then we spray as soon as the blossoms fall and once or twice afterward, as we think is required. As our orchard is usually ridged up in the fall, we use the spring-tooth cultivator and disc harrow until about the middle of July, when further cultivation is prevented by the bending of the branches with fruit. We use ashes (which we buy) and barnyard manure, and the land gets its quota every two years. We invariably apply the manure in the winter as top dressing and work it into the soil, and I think this produces the best results both in wood and fruit. Pears do not require as much fertility as apples or plums.

Of varieties, the best early pears we have are Wilder and Lawson, next Clapps and Bartlett, and for fall and winter pears I would recommend Seckel, Angouleme, Duchess, Precocoe, Clairgeau, Bosc, Compt De Paris, Dr Reider, Dr. Jules Guyot, Com-

mice, Dorset, and President Drouard, not forgetting Keiffer, which has always brought me the most money per tree of any variety that I have.

We had no pear blight last season and very little the season previous. I have great faith in the efficiency of lye from hardwood ashes to prevent pear blight if applied early in the season.

PLANT PRUNING AND GRAFTING.

By A. E. Sherrington, Walkerton.

In planting an apple orchard, the first essential point to be considered is the location and the soil, for a great deal of the success of your orchard depends on these two points. Many people think that it is absolutely necessary that they should have a warm location, and this is just where they make a mistake, for a site that has a slope to the south or south-east is the very worst location possible, as the trees will sunscald, and the buds will swell early in the spring, only to be frozen later on. A site with land sloping to the west or north is preferable, as in that case you will have a cooler location, and the buds will remain dormant later in the season, and thus escape the late spring frost. High or rolling land is best, if such can be had, as high lands are always warmer, and permit of greater circulation of air and sunshine, which is essential to the growing of fruit. Low land should be avoided for orchard growing, for the reason that it is colder, and does not permit of the free passage of air around the trees. Of course, the farmer cannot always have all these conditions; hence has to choose the best he has at his command; but one necessity is that the land should be well drained, if not naturally, then artificially, for trees will not thrive if the roots are standing in water. The soil that I prefer is a clay loam mixed with limestone, as this makes a strong, warm soil. The land should be well manured before planting and worked deep.

A very common mistake when planting an orchard is to plant the trees too close. No standard apple tree should be planted nearer than forty feet each way. Bush trees or early bearing varieties of apples may be grown in between the rows, until such time as the standard trees will need the room, and then they should be removed. The farmer should decide, before planting, whether his orchard is to be a commercial orchard or one merely for family use, and should avoid the mistake, made by many of planting a great many varieties. Do not put in more than five or six at the most, and let these be of the good commercial kinds.

When the trees arrive from the nursery, prune off, with a sharp knife, all the broken or bruised roots, giving a sloping cut from the under side; make a trench in the ground, placing the roots of the trees in it, and cover with clay and water until a mortar is formed, cover well, and leave them there for two or three days before planting. By this method they freshen up considerably, the moist clay adhering to the roots when they are removed to plant, causes the dry clay to cling closely to them, and makes the conditions favorable for an early growth.

In setting the trees dig the holes large and considerably deeper than is required for the trees; fill up the holes with surface soil, so that the trees will stand about three inches deeper than when in the nursery; place the roots straight and natural, and use the surface soil for filling in, packing it firmly around the roots. Leave no vacant places for the air to get in and dry out the roots. Pack the soil firmly to within two inches of the surface, leaving the top mellow and loose, so as to retain the moisture.

The reason so many young trees have failed to grow is because all of the top has been left on, just as when grown in the nursery. It must be remembered that more than half of the roots are left in the ground when dug, so that the top should be thinned and cut back to correspond with the roots. This should be done immediately

after planting. Leave three or four limbs to form the head of the tree, and thin out and cut back the rest just above the bud. It also must be remembered that the tree can take no nourishment from the soil until the new roots are formed, and if the whole top is allowed to remain it is too great a drain on the material stored up in the plant. This is one great reason why so many trees die the first or second year after planting.

The success of the orchard depends largely upon the care that it receives when young. It should be well cultivated and fertilized; corn or roots should be grown in the orchard, but do not plant too close to the trees, and allow room for cultivation. Keep the young trees growing vigorously. Clover may be grown for one year, and then plowed under, and this will add nitrogen and humus to the soil. Cultivate intelligently, prune annually and spray faithfully, and you will be well repaid.

Now, to those who are contemplating planting an orchard, I would recommend the planting of such hardy varieties as the Talman Sweet, Pewaukee, and McMahon's White, the Talman preferred. Cut the head as directed above, and when grown two years, or the limbs have made a growth of three-quarters of an inch in diameter, top-graft them to the variety wanted. By this method you will know just what you have in your orchard, and this is not always the case when getting your trees from the nursery. Another advantage is that you will have a stronger and better tree, and one that will come into bearing earlier. This is especially the case with the Spy and King. We know that there is individuality in trees as well as in animals, so some attention should be paid to the trees from which the scions are taken, and be sure that they are taken from trees that give good annual crops of apples of fine quality. Under these circumstances you may expect that your orchard will be just like the orchard from which the scions are taken.

In grafting trees the limbs should be cut at from three to four inches from the forks of the tree, as this method insures a strong, vigorous stalk, with well knit forks. This is especially true of the Talman Sweet.

REPORT OF COMMITTEE ON FRUIT EXHIBIT AT LEAMINGTON.

Simcoe Station, G. C. Caston. 25 plates. McIntosh, N. W. Greening, King, Shawassie, Ontario, Peerless, Stark, Salome, Shackelford, Spy, Pewaukee, Mann, Swaar, Cooper's Market, Winter Rose.

Lake Huron Station, A. E. Sherrington. 23 plates, 15 varieties. 6 plates N. Spy, N. W. Greening, Shackelford, King, R. I. Greening, Wagener, Ontario, Mann, 2 Pewaukee, Wealthy, 2 G. Russet, 2 Salome, Ben Davis, Ribston, Seek.

F. E. Webster, Creemore, 8 plates. Fallawater, Wagener, King, Ben Davis, Cabashea, Cayuga, Snow, Greening.

Robt. Thompson, St. Catharines. 34 plates apples and 1 quince, 25 varieties. Talman, Cayuga, Cabashea, Seek, Mann, Jenetting, Golden Russet, Fameuse, Canada Red, Jellifleur, Blenheim, Haas, 3 Baldwin, Roxbury, Swayzie, Pomme Grise, Newtown, Ben Davis, Greening, Fall Pippin, Bellefleur, King, Salome, Duchess, Vandevere, Pomme Grise.

W. H. Bunting, St. Catharines. Two cases Baldwins packed for market, 9x12x18, 9 1-2 x 11 x 21.

Albert Pay, St. Catharines. 2 plates Anjou, 2 plates Clairgeau, 1 plate Bosc.

L. B. Rice, Port Huron, Mich. Anjou, Keiffer, and plate of peaches.

Jos. Tweddle, Fruitland. Pyramid of N. Spys, fine quality and highly colored.

W. M. Orr, Fruitland. 4 plates Keiffer, 2 Lawrence, 4 plates grapes.

C. L. Stephens, Orillia. 14 varieties (for identification), 1 Gano, 2 Wagener, 3 and 5 unknown, 4 and 6 Baxter.

South Essex Fruit Exhibit. By Leamington Horticultural Society. A large exhibit of about 25 varieties of apples. A specially fine lot of fruit; 2 large peaches in liquid, 15 plates pears, including Keiffer, Duchess, Clairegeau, Bosc, Anjou; 3 plates quinces.

Bay of Quinte Station, W. H. Dempsey. About 90 varieties. Among others being Spy, Ontario, King, Stark, Ben Davis, Winter Banana, Lawver.

W. L. Smith, Whitby. Pyramid of Kings, very highly colored.

Burlington Station, A. W. Peart. 18 varieties of apples, 7 varieties of peaches, 1 variety of quinces.

J. E. Hambly, Cedar springs, 25 varieties of apples, 3 varieties of pears, 1 variety quince.

J. F. Brennan & Sons, Grimsby. 3 boxes of Spy, graded, wrapped and packed.

St. Lawrence Station, Harold Jones. 20 varieties apples. Snow, McIntosh and Scarlet Pippin, especially fine.

Wm. Rickard, M.P.P., West Durham. 10 plates apples, fine.

East Central Station, R. L. Huggard. 16 plates pears, 20 plates apples.

W. Harris, Day Mills, Algoma. 6 varieties apples from the north. McMahon, Pewaukee, Gideon, Fameuse, Wealthy.

Central Experimental Farm, Ottawa. 63 varieties apples, some of the promising being mentioned in printed list accompanying. Windsor Chief, Edge Hill, Scott's Winter, Dempsey No. 80, McIntosh.

Ontario Agricultural College, Guelph. Collection of wax fruits.

Ottawa Horticultural Society. 33 plates highly colored apples. McIntosh, Alexander, Wolfe River, Baxter; bottle of preserved Herbert raspberry.

A. D. Harkness, Irena. 16 plates of apples, McIntosh and Fameuse, fine.

LIST OF 63 VARIETIES OF APPLES, EXHIBITED AT LEAMINGTON, ONT., GROWN AT THE EXPERIMENTAL FARM, OTTAWA, WITH NOTES ON RELATIVE MERIT.

American Golden Russet (hardy, shy bearer).	Windsor Chief (hardy, recommended).
Allen's Choice (new).	Walworth Pippin (does not mature).
Baxter (hardy).	Arthur (not promising).
Bessil (not promising).	Arabskoe (Russian).
Bogdanoff (Russian).	Borsdorf.
Bell Pippin (not promising).	Black Annette (promising).
Cullender (seedling).	Bethel (hardy, shy bearer).
Clayton (promising).	Cellini (hardy, English variety).
Duke of Connaught.	Canada Baldwin (shy bearer).
Eisike (promising).	Calumet (origin, north of Ottawa).
Furst Taffit.	Dempsey No. 80 (promising).
Forest.	Edgehill (promising).
Gideon (not desirable).	Fameuse (recommended).
Haas.	Fameuse Noire (not promising).
Jennie (not promising).	Huntsman (promising).
Lawver (great keeper).	Hardy.
Milwaukee (recommended).	Kara Sinap (Russian).
Marmalade (Russian).	Missouri Pippin (promising).
Malinda (hardy, not juicy).	McMahon White (hardy, productive).
North Western Greening (recommended).	McIntosh (highly recommended).
Northern Spy (recommended, top grafted).	Minkler (promising).
Pewaukee.	North Star.
Patten's Greening (very hardy).	Palmer (promising).
Russian, No. 17.	Plumb's Cider.
Salome (fruit irregular).	Rubicon.
Sklianka (Russian).	Stone.
Thompson No. 35 (sweet).	Seek (promising).
Wealthy (highly recommended).	Scott's Winter (hardy, recommended).
Walbridge f. x. Northern Spy m. (promising).	Uncle Sam (probably Bethel).
	Waterson No. 3.
	Winter Rose (fairly promising).
	Winesap (a top graft).
	Winter St. Lawrence (not juicy enough).

Horticultural Societies.

At the regular meeting of the Association, held at Walkerton in 1902, a special series of meetings for members of Horticultural Societies was held, and addresses were delivered by prominent horticulturists on subjects of interest to all lovers of flowers. Such was the success of these sessions that at the last annual meeting, held in Leamington, a further enlargement of this idea was carried out. On the last day of the meeting two entire sessions were set aside, and a special building provided in which members of the Horticultural Societies in affiliation with the Ontario Fruit Growers' Association gathered to listen to some of the most prominent floriculturists of the Province. Cayuga Society sent their Secretary, Mr. A. K. Goodman, to deliver an address on the work of Horticultural Societies in towns and cities. Mitchell was represented by Mr. T. H. Race, President of the Mitchell Society, and Woodstock by Mr. Jas. Scarfi, while Guelph sent Prof. Hutt, Miss Rose and others. Quite a number of other societies in the west were represented. This part of the programme was altogether one of the most interesting not only to the delegates, but to the members of the local Horticultural Society in Leamington.

A still further extension of this work will be carried out at the annual meeting in Toronto in November of this year. It is proposed to affiliate with the Toronto Horticultural Society in its annual chrysanthemum show, and to hold besides a large fruit exhibition. As the place of meeting is very central, and affords splendid hotel accommodation and railroad facilities, it is expected that every horticultural society in the Province will appoint a regular delegation to the meeting.

The following papers were among those read at the Leamington meeting. A number of special articles which have been published in the "Canadian Horticulturist" from time to time are also included in this report with the hope that they may be in better form for constant reference when sent out in this volume.

BEAUTIFYING HOME GROUNDS.

By Prof. H. L. Hutt, O.A.C., Guelph.

The sturdy pioneers who first settled this country came with a determination to subdue the forests and to hew out for themselves homes in the wilderness. Their first aim was to clear the land for the growing of crops, and this usually kept them so busy that they had little or no time for levelling of lawns or planting of shade trees and ornamental bushes. But we have now reached a period in the country's history when comfortable homes are thickly dotted throughout the land, and more attention is being given to the beautifying of the home surroundings. Not only is the skill of the landscape architect more and more in demand, but there is a call for information on the subject by those who have not the means to employ a professional gardener. In this paper we shall call attention to some of the leading principles which should guide in laying out and beautifying the surroundings of a country home.

In the first place it must be understood that the most beautiful scenes are, as a rule, more or less natural. We should, therefore, accept nature as our teacher, and study the materials and combinations which go to make up natural beauties.

The materials with which the landscape gardener has to deal may be classified as natural and artificial. The natural materials are the ground, grass, trees, shrubs, vines,

herbaceous plants and annuals, and in some cases rocks and bodies of water. The artificial materials are trees and shrubs clipped into unnatural shapes, geometrical beds of improved flowers, terraces, walks, drives, buildings, fountains, statuary, etc. The skill of the landscape gardener in producing beautiful effects depends upon the judicious use of these materials. We shall now treat of some of these in detail.

The Ground. One of the most important features in the ground surrounding a home is the contour of its surface. This is what gives character to a place. A low lying lawn, with something of a depression in the centre, has a somewhat tame appearance, while an otherwise similar lawn, with but a slight crowning in the centre, has an altogether different appearance. Sometimes a perfectly straight surface line is pleasing, and the level lawn is more in keeping with the place and its surroundings than any other could be, but as a rule some variation from the straight line is preferable. In nature we take more delight in bold outlines of hills and valleys than we do in level stretches of country. This is because we love the variety which hill and hollow affords, and this suggests the desirability of introducing undulations in landscape gardening whenever the size of the grounds and other circumstances will permit.

The buildings should, of course, be on the highest elevation, and the grounds should be made to slope away from them. On a steep hillside the grounds may have to be terraced, which, if well done, adds much to the appearance of a place, but likewise adds considerably to the cost. Whether the grounds are flat or rolling the small irregularities of the surface should be levelled and smoothed so that the mower may be worked easily. Wherever much grading or filling has to be done due allowance must be made for settling, and a few inches of good surface soil should always be left on top. The character of the surface soil is a matter of great importance, because on it depends the luxuriance or poverty of the grass and the trees growing over it.

The Green Sward. There are two ways of clothing the ground with grass, either by sodding or by sowing grass seed. On small plots or steep banks and along borders, sodding is the quickest and most satisfactory method, but on large areas seeding is not only the cheapest, but the best. In preparing the ground for seeding it should be plowed, harrowed, rolled and made as fine as possible, and as a final preparation nothing is better than going over it carefully with a garden rake.

The kind of seed to sow is a matter of importance. Coarse grasses, such as timothy, are not suitable for lawn making. Many of the finer and more delicate grasses may be obtained in 'lawn grass mixtures,' but the most satisfactory mixture we have found is made up of equal parts by weight of Kentucky blue grass, red top grass, and white Dutch clover. All of these are hardy and stand well the extremes of our climate. The seeding should be done on a still day when there is no wind to carry the lighter seeds. Thick seeding should be the rule. Three or four bushels per acre is none too much for seeding down a lawn. In fact, the grass should come up as thick as the hair on a dog's back. After the seed is sown it should be lightly raked in, and if the weather is dry it is well to go over the ground with a hand roller. The work of making a lawn may be done at almost any time of the year, but where much levelling and filling is necessary it is well to do the grading in the fall, so that the ground will have finished settling by the spring, and then the surface may be raked over as soon as it is dry enough to work, and the seeds sown as early as possible. A lawn sown early in the spring should be nice and green by the middle of the summer, or seed sown early in the fall should give a good grassy carpet early next spring.

Keeping a Lawn. To keep a lawn in prime velvety condition it should be mowed frequently, particularly during the season of rapid growth. The mowings should be so frequent that none of the grass should have to be raked off. This is the practice followed on well-kept city lawns where men, money and mowers are available. On the farm, where these articles are not so plentiful, and where the area to be gone over is usually greater, it may be kept in very respectable conditions with the ordinary farm mower,

the cutter bar of which should be set low and the knives kept sharp. On the farm the front yard and back yard, the lanes and the roadsides should be levelled, seeded and put in such condition that they can all be gone over with the farm mower, and if the mowing is done as often as the grass is high enough for the knives to cut nicely, the improvement made in the appearance of a place would in many cases add nearly 50 per cent. to the value of the property.

To maintain a luxuriant growth and a rich dark green in the color of the grass, the lawn should occasionally receive a top dressing of stable manure in the fall. The soluble portion of this is washed into the ground by the fall and spring rains, and early in the spring the coarsest portion of the manure should be raked off.

Trees and Shrubs. In the trees and shrubs we have some of the finest forms of natural beauty. They present a great variety of ornamental qualities, in habit of growth, in size, in color of bark and foliage, and in their flowers.

Taking the trees first, they may naturally be divided into two classes, the deciduous and the evergreen trees. If space permitted we could give a lengthy list and mention the special claim of each to a place on the lawn, but we must be content with mentioning only a few of the most desirable. Among the maples we have the sugar maples, the soft maples, and Weir's cut-leaved variety of the same, the Sycamore maple, and the Box elder, sometimes called the Manitoba maple, which is particularly valuable on new places on account of its rapid growth, but along with it should be planted some of the more durable trees, which will come in and last long after the Box elder has served its purpose. As a successor to it we know of none better than our native American elm. In its finest form, with feathered trunk, high spreading arms and long, pendulous branches, this is, in our opinion, the most stately and graceful of our native trees. On large grounds, where there is room for variety, some of the rugged oaks and fragrant lindens add a charm to the scene. The cut-leaf weeping white birch is very ornamental in both summer and winter, and shows a striking color contrast, particularly when placed so as to have for a background a group of evergreens or a dark-colored building.

Among the evergreens the pines and spruces occupy a first rank. The Austrian and Scotch pines make handsome specimens, although when young our native white pine is equal, if not superior to, any of the foreigners. The same might also be said of our native white spruce, as compared with its more vigorous relative from Norway. But for a handsome specimen of nature's coloring let us have the dainty little blue spruce of Colorado. Among the arbor vitae, junipers and retinosperas there are some very beautiful forms, such as the pyramidal and globose arbor vitae, the tall Irish juniper, and the plumose retinospira, but those last mentioned are less hardy than the arbor vitae and require protection for a few years in the colder sections of Ontario.

Ornamental Shrubs. For a list of some of the most desirable and hardy ornamental shrubs adapted to our northern section, I cannot do better than refer intending planters to the valuable list given in Mr Macoun's report in the Central Experimental Farm Report for 1897. One hundred species and varieties are there mentioned, with twenty-five of the most desirable marked. If we were compelled to reduce the list to half of that number, we would from our own experience select the following: The Caragana or Siberian pea tree. Hydranga paniculata, the Tartarian bush honeysuckle, the mock orange or Philadelphus, the golden currant, Spirea Van Houtteii, the Weigelia, the purple fringe, the old-fashioned lilacs in variety, the snowball or Viburnum, and last but not least, roses in variety.

Arrangement of Trees and Shrubs. To artistically arrange and distribute a collection of trees and shrubs on the lawn requires much more skill and judgment than to set out trees in a straight line in an orchard. The following rules should be observed in lawn planting:

1. Follow the Natural Order of Arrangement. Nature does not plant in stiff and formal geometrical lines, but rather in irregular profusion, in too much profusion. It is

often necessary, therefore, to modify the natural arrangement to meet the needs of the case. One has said that "the aim should be to exhibit nature idealized rather than nature real. A prominent American landscape gardener tells us that for his first lesson in arranging trees on the lawn he was told to take in his hands as many stones as he had trees to plant; to stand by the house and throw them in the direction he wished the trees to stand, then plant wherever the stones fell. He says that with a few slight modifications the effect was all that could be desired.

2. Arrange to Give an Air of Breadth and Expanse to the Place. This is a most desirable effect, and is secured by preserving a more or less open lawn in front of the house, by scattering and grouping the larger trees at the outside of the grounds so as to more or less hide the boundaries. This suggests an unlimited extent, beyond what the eye can see at any point. Another means is by opening vistas between the trees, looking out upon distant scenes beyond the boundaries. In this way we may shut out undesirable objects, and we may appropriate to ourselves desirable scenes, such as a wooded hillside, a stretch of river, or a church spire, and thus make our little grounds seem like part of an extensive park.

3. Arrange for Trees to Give Comfort as Well as Ornament. One of the first considerations should be to shade the buildings from the heat of the sun and to shelter them from the sweep of the prevailing winds. On the south and west should be planted a few of the largest trees, such as elms or maples, not so close as to exclude the light from any of the windows, nor so that any of the branches, when the trees are full grown will overhang the house, but close enough that their shade will fall upon it. In all planting the effect should be watched from the principal windows, and we must take into consideration what the results will be when the trees are full grown.

As a protection against the sweeping winds of winter some of the strong growing evergreens, such as pines and spruces, are most useful. Thick belts or clumps of these should be planted on the most exposed quarters, and along with them may be planted a few of the light-colored deciduous trees. In winter the evergreens give a cosy appearance to the place, and in summer their sombre darkness is relieved by the bright green of the deciduous trees.

In arranging the smaller trees and flowering shrubs, these may be grouped into ornamental groups, or occasionally fine specimens may stand out by themselves. When grouping into clumps the tallest-growing specimens should be placed in the centre, and along the border, the smallest shrubs should come to the front so as to blend the grass with the taller trees in the background.

Beautiful color combinations and contrasts, both in flower and foliage, may often be arranged if the planter understands his work. For instance, a beautiful color contrast is obtained by planting a purple-leaved barberry near a golden-leaved spiraea or a dark Austrian pine as a background for one of the light-colored Colorado spruces.

Vines and Climbers. Among the vines and climbers we have a number of beautiful species which may be made very effective in many ways in beautifying the home surroundings. They are particularly valuable on small grounds and town lots, as they take up so little room, but they are also quite as valuable in beautifying a country home. One of the most hardy and vigorous is the common Virginia creeper. This is excellent for covering a summer house or an unsightly wooden wall. As a covering for a brick or stone wall the Boston Ivy (*Ampelopsis Veitchii*) is one of the handsomest. In northern sections it requires winter protection for the first few winters, but when once established it grows rapidly, and will soon convert a brown or red front into a wall of living green. For a handsome, hardy-flowering climber we have nothing to equal Clematis Jackmanni, with its large purple flowers; and Clematis paniculata, with its innumerable small white flowers late in the fall. Hall's climbing honeysuckle and the Chinese Wisteria are beautiful climbers, well adapted to climbing verandah posts or festooning a balcony, but they will not stand our winters without protection except in the southern parts of the Province.

Walks and Drives. These are not in themselves very ornamental, but they are necessary and have an important effect in the appearance of a place.

When properly located they convey the idea that the place is inhabited, and they seem to impart an air of welcome.

As the walks and drives are artificial, and not in themselves ornamental, there should be as few as possible. Business roads should as a rule be straight, but pleasure drives give more pleasure if they are laid out in graceful curves. The curves give variety and help to relieve the angular outlines of the buildings. They should not, however, be introduced at the expense of utility, and should offer no temptation to take short cuts across the grass. Whenever a curve is introduced there should be trees, or some object in the road to make the curve appear necessary. If such are not there when the drive is laid out, they may be planted afterwards. A curve without some apparent cause for it looks meaningless and affected.

The drive, whenever possible, should enter at the side of the lawn, and curve gently around towards the buildings as though it were the nearest and most natural way of approach. It should be dotted here and there along the side with trees and shrubbery, which partly screen the building from sight, so that we keep getting a different view of the house as we approach. This gives variety and pleasure, and always leaves just enough unseen to make us feel like following it up to see where it leads to.

The width of drives and walks should vary according to their length and the amount of travel upon them. If long and much travelled the drive must be wide enough for two rigs to pass easily, but if short and not so much used, 8 to 10 feet, or room for one wagon, is enough. Walks or footpaths will vary from 3 to 5 feet. The drive and walks should be properly graded and made slightly crowning from the centre to the sides so as to give good drainage. If good gravel is obtainable they should be covered with gravel, raked smooth and rolled hard.

Fences. As a rule fences enter largely into most landscapes, and are worthy of note. They are artificial materials, and at best they are necessary eyesores, but in the majority of cases their necessity is only imaginary. If all of the really unnecessary fences were removed, and the ground which they occupy levelled and seeded down or put under crop it would make a wonderful difference in the appearance of the country. It would remove a great harbor for weeds and insects; it would effect a great saving of labor and expense, and it would remove one of the most striking features which advertise the slovenly farmers all over the country. The only fences necessary, or which should be necessary, are those for the purpose of fencing in stock, and not fencing out that of our neighbors. Fences, in many cases, might be movable or temporary. Roadside fences in many sections might be dispensed with, the ground levelled and seeded and the grass kept mowed from the boundary to the roadbed. Bill Nye says that "the farm without a fence in front of it looks as if the owner were honest and thought his neighbors the same." If a permanent fence is necessary let it be as inconspicuous as possible, or let it be an ornamental hedge.

Some of the other artificial materials sometimes used in landscape gardening are trees, trimmed into fantastic shape, fountains and statuary, flower beds of geometrical designs. All these are artificial and should be used with as much discretion as one should use in wearing fine jewellery. The more the artificial prevails in the general surroundings the more these can be used without giving offence. In proximity to large and expensive buildings, or in extensive parks, they may have their place, but on the farmer's lawn, where most of the surroundings are natural, and where the buildings are not elaborate and costly, they would be altogether out of place.

Q.: Does not the elevation of the lawn depend on the relation to the street, and the position?

A.: Very often it does, to a certain extent.

Q.: Is there any possibility of ridding a lawn of dandelions?

A.: If the lawn is given a top dressing of manure in the winter, the grass comes up so quickly that it crowds out the dandelions.

Q.: Is it any advantage to leave the clippings on a lawn?

A.: They may be left if the grass is kept short, but if the grass is allowed to grow too long it is injurious to leave the clippings, and they should be raked off.

Q.: Is potash good to use on a lawn?

A.: An ordinary application of potash is good.

A Member: Tobacco dust is very good on lawns. It is excellent to drive away ants and insects, and to brighten the color of the grass.

Q.: Should the elm be left in its natural state, with branches right at the trunk?

A.: Yes; feathered up the trunk with little short branches. Leave the little branches along the trunk if they are there. I like to see the elm in its natural state.

Q.: How high should the Colorado Spruce grow?

A.: I have seen specimens about 18 to 20 feet high. They very seldom grow more. They are very hardy and of more striking beauty than the others.

Q.: Is there any variety of lilac that will not sucker?

A.: That is the great objection to any of the lilac family. Still I would not try to prevent them. They get into a clump. It is not necessary, however, to let them spread too far.

Q.: Should the Clematis be cut down each fall?

A.: It is not necessary. I would not like to cut them down too much. They can be cut back to some extent, but not too far. Leave most of the old cane on. If you wish to cover a large surface, leave the old vine on, but if not cut some of it off.

Q.: Professor Hutt did not mention the Schwedleri maple. I would like to ask if he likes that?

A.: I do. I think it is a very striking maple. We have fifteen or sixteen varieties of maples on the lawn, and in the spring that is the most striking one of the lot, with its copper-colored or blood-colored leaves.

Q.: Is the purple beech a hardy tree?

A.: Very hardy, but hard to transplant, and very slow in growing. For a purple tree, however, *Prunus Pissardii*, or purple plum, will hold its color better than anything I know of. It holds its color the whole season.

Mr. Race: I am surprised that some of you did not ask Mr. Hutt what kind of a maple he would have you grow on your streets. He could answer it very truthfully by saying, any kind of maple rather than none at all. Nature has done much for your town, but you have not done much for yourselves. In our town every street is paved below and shaded above.

WINTER WINDOW GARDENING.

By Wm. Hunt, Ontario Agricultural College, Guelph.

The most important feature necessary for success in winter window gardening is the window itself. A window in a bright sunny position where a temperature of about 50 to 55 degrees can be maintained at night with a day temperature of from 60 to 70 degrees, will furnish the most desirable surroundings in which to grow successfully a collection of window plants in winter.

Many plants can, however, be grown under less favorable circumstances. Ferns, selaginellas or exotic mosses, aspidistras, *Ficus Elastica* or Rubber plant, *Cyperus alternifolia* (Umbrella plant) or even the Arum, or Calla Lily, as it is usually termed, are some of the plants that can be grown in windows having a more northerly aspect, where the direct rays of the sun never reach in winter time. But for flowering plants a more southerly aspect is necessary to secure good flowering results; a window facing the southeast being perhaps preferable, as it escapes the direct rays of the sun at noon,

that sometimes even in winter time strikes much too warm in a south window for the well-being of many window plants. It is desirable on very bright days, especially in late winter or early spring, to shade plants in windows having a southerly aspect, by pulling down the blinds or by partially closing the shutters for an hour or two during the hottest part of the day.

A very high temperature at midday and perhaps an equally low temperature at night is not beneficial to the growth of plants, and often induces an attack of insect pests, or of disease, that prove disastrous to a whole collection of plants. An ordinary equable house temperature, such as I first mentioned, with as moist an atmosphere as possible maintained around and about the plants, will be found the most desirable conditions for the successful winter culture of window plants.

To secure the last mentioned condition in ordinary windows is often a difficult problem, as the surroundings are not adapted for using much water around and about the plants. Much can, however, be done by spraying or sprinkling the foliage of the plants on fine sunny days, more especially the smooth or glossy-leaved varieties; or by sponging the leaves of these with a sponge and some clear tepid water. About once in every two weeks will suffice for this sprinkling or sponging. The plants can perhaps be removed to the kitchen sink occasionally, where no damage can be done the surroundings by sprinkling.

Hirsute or hairy-leaved plants should not be sponged at all, Rex begonias objecting most decidedly to this procedure. Geraniums, heliotrope, coleus, etc., do not require much, if any, syringing or dampening of the foliage; whilst Calla lilies, Fuchsias, Roses, Rubber plants, Cordylines, and other smooth foliage plants delight in a sprinkle or sponging with clear water very frequently. Always choose a sunny warm day for this operation, and at a time when the thermometer registers about 65 degrees in the window, or wherever the operation of sponging or syringing is performed.

Much might be said as to the construction and planning of a suitable window and fittings, in which a collection of window plants could be successfully grown, but time will not permit. I feel quite justified, however, in saying that with the increasing interest shown by our people in the culture and growth of plants and flowers around the home, that architects and home builders might well make this matter of suitable window building a much more prominent feature in their building plans than they have hitherto done. There is no reason why even the smallest villa or cottage could not have a window so constructed, that the necessary overhead light and the necessary heat could be obtained, without adding but very little additional expense to the building estimates of a residence.

Watering Plants. This is a matter that often troubles the plant grower considerably. No set rule can be given to suit all kinds of plants and their condition, but it is always safe to give any plant that is in a good growing condition a good supply of water at the roots whenever the top portion of the soil shows signs of dryness. Giving the plant a small quantity of water at stated times or at regular intervals, is not the right method to adopt in watering plants. Ascertain first by closely observing the top of the soil in the pot, whether the plant requires water or not. If the soil appears dry, give sufficient water to thoroughly moisten (not sodden) all the soil in the pot, and do not water the plant again until the soil show signs of dryness again. It may be one day, or it may be a week or even a longer time before it requires more water, but when water is given the plant, see that it gets sufficient to well moisten all the soil in the pot.

Another method of ascertaining whether pot plants require water, is to tap slightly the side of the pot with the knuckles. If the pot when struck emits a ringing sound, the plant requires water. If on the contrary only a dull thud-like sound is given out when the pot is tapped, water had better be withheld from the plant for a short time.

Over-watering, over-potting, and insufficient drainage are often the main causes of failure in the culture of window plants.

Over-potting is a term used when a plant is potted into a pot two or three sizes larger than the plant requires.

For drainage in pots there is nothing better than small pieces of broken flower pot. About an inch in depth of broken pot can be usually used for six-inch pots and larger sizes, whilst half that quantity can be used for smaller-sized pots than four-inch. Use small pieces of broken pot for the small pots, half an inch square being a good average; whilst larger pieces should be used for the larger-sized pots. Coal cinders or coarse gravel can also be used for drainage, but these are more liable to clog and choke than broken pieces of pot.

This matter of drainage is one of the most essential points necessary to success with almost all pot plants, more especially window plants.

The insect pests that are all too common to house and window plants, have been very ably described to you by Dr. Fletcher, as well as preventives and remedies recommended for the attacks of these troublesome and destructive visitors, so that it is unnecessary for me to speak on this matter. Suffice it to say that much can be done to prevent the attacks of insect pests by endeavoring to give window plants as nearly as possible the conditions I have mentioned, as extremes of heat, drought, or moisture are the main inducements for insects or disease to attack plant life at any time.

To succeed with a collection, or even a few window plants, they must be closely watched, always keeping in mind the old adage: "That an ounce of prevention is better than a pound of cure."

To secure a bright healthy-looking collection of plants during the winter, it is necessary to commence preparations during the preceding summer and autumn months. It is useless and unnatural to expect plants that have been doing duty as decorative plants on the lawn or in the flower border all the summer, to continue in their brightness and beauty in the winter as well. Plant life of all kinds, demands more or less of a resting period at some season of the year, no matter whether they are plants from a tropical or a more temperate zone.

The all-enduring geranium even, will not meet the exacting demands for continuous flowering that is sometimes made on it by plant lovers.

If geraniums are wanted for the window in winter and give good results, they must be grown specially during the summer for that purpose. By striking a few cuttings early in the summer and growing them on in pots out of doors, nice plants can be had by autumn to take into the house. Small plants at planting out time in early June, potted into six or seven inch pots, and the pots plunged to the rim in the ground until fall, will make nice plants for the window in winter. The tips of the growth should be pinched back until August, and all bloom buds as soon as they are seen kept pinched off until September. By plunging the pots in the ground they require less water and make better plants, than if they are left standing above the ground.

Many so-called spring flowering bulbs make ideal pot plants for the window in winter, in fact, I know of no class of plants that give such good results with so little skill and care required to bring them to perfection.

The one great point to be gained to be thoroughly successful in growing these bulbs is to secure a good root growth before top growth commences.

The only way to do this is to give the bulbs as nearly as possible the same conditions for a time, as they receive when planted in the open ground.

By potting a few of the various kinds of bulbs suitable for pot culture at intervals from the end of August to early in December and burying the pots in coal ashes, sand, or light soil a few inches deep, for a month or six weeks or even longer, a good supply of roots will be obtained, when the pots can be brought in at intervals to the window as required. When the bulbs are first potted the soil should be thoroughly watered. If well packed and covered with ashes, etc., as before mentioned, they will require no more water until they are brought out into the window. After this the soil must never be allowed to become quite dry in the pot. A damp, cool place suits bulbs best to make roots in.

Roman Hyacinths can be potted in August and plunged out of doors until October when they will be ready for bringing into the window as required. There is no bulb that will give more satisfaction than the Roman Hyacinth—the white variety being preferable, if treated as I have described, as they give such a plentiful supply of their sweet-scented waxy white flowers in return for the small amount of care they require, and besides they are not very particular about the kind of soil they grow in, provided it is not of too heavy a nature. This remark as regards soil will apply to almost all kinds of bulbs used for pot culture.

Dutch Hyacinths and several varieties of Narcissi—Von Scion, Poeticus, and the Trumpet Narcissi, are among the best and easiest varieties of bulbs to grow in a window, although the Jonquills and other types of Narcissi than those mentioned succeed splendidly as window plants. These last-mentioned species of bulbs are later flowering than the Roman Hyacinths and do not usually come into flower until February or later. When potting these later flowering bulbs, it would be advisable to bury the pots in the cellar, or plunge them in some position where they could be protected from very severe frost. A certain amount of freezing will not hurt them, but it is difficult to remove the pots without injury when they are frozen too hard.

All potted bulbs require plenty of water after they are brought out to the light, that is the soil should never become really dry at any time.

In potting bulbs, the top or apex of the bulb should be barely showing above the surface of the soil. Three Roman Hyacinths and three or four bulbs of Narcissi can usually be planted in a four or five inch pot. In the case of Dutch Hyacinths one bulb to a four-inch pot is usually sufficient.

The Freesia is another useful and easily-grown winter flowering bulb. Plant five or six bulbs in a four or five inch pot in the manner described for Hyacinths, etc., but do not bury the pots under ashes or soil. Stand the pots in a fairly sunny position in a temperature of about 50 degrees or 60 degrees, and water sparingly after the first watering until growth has well commenced. The first Freesia bulbs can be potted in August, and as often as required afterwards until November. The delicious odor from only a single spray of these flowers will perfume a large house. Late-planted Freesias should be started in the window.

The Arum or Calla Lily should be kept nearly or quite dry during the summer months. The best place for these lilies during the summer is to lay the pots on their sides about the first of June or as soon as they are out of flower. A shaded position under trees or in the shade of a building or fence is a good place for them whilst dormant. Re-pot them in August, if necessary, but do not over-pot them, as too large a pot often means a lot of leaves and no lilies. Give the plants lots of water whilst they are in a growing condition, never allow the soil to become quite dry. Some drainage placed at the bottom of the pot when re-potting is advisable. Use light, rich soil for Callas.

Many varieties of Begonia make splendid window plants for winter. Among the most satisfactory is the beautiful golden blotched-leaf variety, *Begonia manicata aurea*, this is, in my opinion, the best window Begonia we have for winter time. *Begonia argentea guttata* is also another useful variety, also the Paul Bruant variety. The *Begonia incarnata rosea*, with its pretty pale, pink blossoms, that it produces so freely at Christmas time is another that should not be overlooked, but it is rather more delicate than those first mentioned.

The Rex or ornamental-leaved Begonias make pretty window plants. Many people fail with these Begonias from placing them in a sunny position in the window, and by over-potting them.

All Begonias like a light soil to grow in. One-third of fine sharp sand and two-thirds of fairly rich, loamy, potting soil makes a good admixture of soil for Begonias. A little well rotted leaf soil mixed in will be beneficial. Use nearly an inch of drainage in the bottom of the pots when potting Begonias. Begonias like a temperature of 65 to

70 degrees, but do not like very much real hot sun, preferring partial shade, at noon-day especially.

Many more varieties of Begonias could be mentioned, but those I have named are among the **best for windows in winter.**

A very easily grown and effective window plant is the *Anthericum picturatum*. Its pretty striped foliage makes it a bright conspicuous feature at any season of the year, more particularly in winter, its silvery ribbon-like leaves contrasting very prettily with the almost universal green of the foliage of winter window plants. These plants like a temperature of about 65 degrees, and require a rather shaded position in the window. Plenty of water should be given them, as a very dry condition of the soil often results in serious injury, and perhaps the total loss of the plant, if the drought is of long duration.

There are many other species of plants suitable and comparatively easy of culture in windows, but time will only allow of a few being mentioned. Amongst them is the *Cyperus alternifolius* or Umbrella plant, that delights in a warm partially-shaded window, where the sun does not strike at noonday. Given this position with plenty of water at the roots, and its foliage also given a dip once or twice a week in water, its whorls of delicate green leaves will retain their freshness much longer than if they are kept in a dry overheated atmosphere.

Many varieties of Cactus also help to relieve the sameness that a collection of window plants often present in winter. Cactus like plenty of drainage in the pot, plenty of sand (nearly half) in the potting soil, and not too frequent watering. The Lobster cactus (*Epiphyllum truncatum*) as well as a few of the quicker growing cactus of the *Phyllocactus* type may like a little richer and heavier soil, but there is danger even to these unless plenty of drainage is given, as well as care in watering, as they are very liable to rot at the base of the growth, especially if over-potted.

The *Farfugium grande*, (Leopard plant) is also a good window plant, its thick leathery gold-spotted leaves being particularly noticeable in a window. It delights in a rather cool, shaded window, requiring plenty of moisture at the roots. This is one among the few plants that succeed better in a window than in most greenhouses. It is seldom a good specimen is seen in a greenhouse, whilst handsome specimens a foot or two in diameter are often seen in dwelling house windows, as well as on verandahs in summer.

The *Ficus elastica* (Rubber plant) is a good, enduring window plant. Its leaves require sponging frequently to increase and preserve the glossy green of its foliage, the latter, together with its power of resisting gas and the bad effect of a dry atmosphere, being its chief points of recommendation as a window plant, as it is not of a very graceful appearance, even under the very best conditions.

Amongst climbing or trailing plants the several varieties of *Tradescantia* or Wandering Jew, as well as the variegated Japanese Vincas or Periwinkles, cannot be omitted. The *Saxifraga sarmentosa* (Spider Wort or Mother of Thousands) is also a splendid plant for a hanging pot or basket in a window.

The rampant growing plant known as the German or Cape Ivy is a grand climber for the window, a single plant often covering the entire window.

During the address practical illustrations were given by the lecturer of the methods of propagating most of the plants mentioned. The method of propagating the *Ficus* or Rubber plant by mossing partially severed cuttings whilst the branch or cutting is still left on the plant, was most interesting. Cutting up the leaves of the *Rex Begonia* into disc and sectional cuttings from the leaves of these plants was also fully illustrated and described, as well as the best methods and seasons of the year for propagating them. Propagation from terminal cuttings from plants such as the fuchsias, geraniums, begonias, etc., was fully illustrated and explained, as well as sectional stem cuttings and raising plants from root cuttings, natural specimens being used in different demonstrations made during the progress of the address.

It was also explained that clean, sharp, fine sand placed in well-drained pots or shallow boxes was the best material for rooting cuttings of most window plants, the summer time being the season when success was most likely to crown the efforts of the amateur in increasing his stock of window plants from cuttings of any kind. The best kind of soil to furnish the basis of a good potting compost for window plants is obtained from cutting sod from a pasture field, where the soil is of a loamy nature, and the grass kept fed down. Cut the sod about four inches thick and the size over of a spade. Make a pile of sufficient size of this sod by first laying two thicknesses of sod, with the grass side downward, then put about the depth of one sod, three or four inches, of cow manure. Continue this succession of sod and manure until the pile is large enough. Make the pile outside, in any corner of the garden, away from chickens and animals. In six months it will be ready for use. The compost can be tempered with sand or leaf soil as required, for plants that require very light soil, such as Begonias, Fuchsias, Ferns, etc., but for Geraniums, Roses, Bulbs, and the majority of window plants, the sod compost will suit splendidly, especially if the sod is taken from a sandy, loamy soil.

Q.: When your tulips are done blooming, do you take them up every year?

A.: No; I take them up every third year. Your soil up here is much better than our soil for growing tulips. If I were in your soil I would put my tulips in at least six inches. As soon as they are done blooming, I take a very sharp hoe and take them off right close to the ground, and the stem that extends from the surface is quite sufficient to develop that bulb. Do not pull it, because if you do you will break the bulb. I leave mine three years, and take them up every third year. It is not at all necessary to take them up every year.

Q.: Is it allowable to give them a shady site, or is it necessary to give them a southern or western exposure?

A.: You will probably get a more brilliant display from a sunny situation, but tulips will do well even in the shade, or partial shade, and, the tulip being early, the trees are never in full leaf when they are blooming, and the shade is never very heavy at that time. I know of a case at home where on the north side of a house the tulips were more than two weeks later. They grow a little later, and a little more delicate in the stock when given a shady position. You can retain flowers much longer in the shade than in the sun.

Q.: Tell us how to cut them for bouquets.

A.: Those cut when they are shut up keep much longer. As with all flowers, the proper time to cut is in the morning. Take, for example, the rose. As soon as the sun comes up early in the day it opens up. But if you cut it early in the morning, it will remain all day. It is better to cut all flowers in the morning, especially the gladiolus.

Q.: I would like some information regarding the Wisteria. I have a large plant that makes a great deal of growth, but does not bloom. Would it be possible to transplant it, and what care would need to be exercised in trying to transplant it?

A.: With regard to the Wisteria, like all clinging plants, when they get very large they are very hard to transplant. In this case it seems to me that it would not be wise to transplant after it has grown to a large size. I had one for over twenty years, and it flowered regularly, though it was a great many years before it started blooming; very often that is the way with the Wisteria.

Q.: Would it be possible to train these on to a trellis? Each one is near a verandah, but not on a trellis.

A.: I do not think that would have any effect.

Q.: What is the proper method of pruning the Wisteria?

A.: Thin out the young saplings so as not to let them grow too thick. I saw a Wisteria between forty and fifty feet thick. It was a great age. I bought a Wisteria about fifteen years ago, and planted it, and it was nine or ten years before it showed any signs of flowering at all, and when it did, it was a very poor blossom. I am inclined to think that some are not true to the original type of Wisteria, the Chinese Wisteria,

Q.: But this was much smaller than the Chinese variety, a different variety and different growth.

A.: It is quite possible that you may have one of that kind. It is very similar to that kind of Wisteria. If you can, get it when it has leaves on and compare it with the Chinese Wisteria. You can soon tell. There was a question asked in Toronto lately on the same subject, and I tried to answer it as best I could. The Chinese Wisteria takes several years to flower. I would not advise you to transplant it. I would rather leave it; just partially sever the growth, peg it to the ground, and allow it to root there, and transplant it to the east side of the house.

Q.: And just destroy the old plant?

A.: Of course, it is just a matter of whether you feel like giving it place or not. **Some I know leave it.**

Q.: What would you consider the best half dozen varieties of roses to have?

Mr. T. H. Race, Mitchell: I would advise something different here to what I would have in my own district. I have given special study to the rose, and have also specially studied our own country. You could produce roses here that I could not.

We will start with the darkest rose. Take the Baron de Bonstetten to begin with. Next take the Jacque, the General Jacqueminot. The next in color would be the Alfred Colomb. Then take the Francois Levet, a beautiful thing, and a strong grower. Next, the Mrs. J. H. Laing, then the Magna Charta. Paul Neyron comes next; then another beautiful rose, the Madame Gabriel Luizet. Again, I do not like to leave out the Mrs. Sherman Crawford, a magnificent rose. There is no white rose that seems perfect. I think that will be enough for you to start out on.

Q.: Do you think it possible to winter the tea rose outdoors? I met a gentleman from Ingersoll who said he had been wintering them for several years by putting a layer of earth and then boards over them.

A.: In my own town I grow very healthy tea roses in the air. I would hardly recommend tea roses, however, as you are liable to disappointments, and it is far better to cultivate a taste in people by a few really hardy roses than to start on these.

Mr. Hunt: I think that is just the right plan. In regard to tea roses, I grew the tea roses planted out in greenhouses on a bench, and after they had stood there a winter in the greenhouse temperature, and were through flowering, they were taken off the benches, and planted in a sheltered quarter outside with an eastern exposure. It is a very favorable site, and they have stood there for two years, and last September I had the pleasure of picking some roses from these same plants. At the same time, I consider that an exception. These succeeded well, though unprotected, but I do not consider them hardy, and do not advise to plant them. Down in that section of the country sometimes tea roses will come through, but we have had very mild winters, and this is the exception rather than the rule.

Q.: Would a man get good results by planting tea roses each year, like any other plant?

A.: Yes, under certain conditions, but it would be necessary to have very large plants, and this would be very expensive. You would need them about two years old to get good results, and these are about 75 cents a plant. I would not advise this, unless you want to make a specialty along that line.

THE COLEUS AND OTHER FOLIAGE PLANTS.

By J. S. Scarff, Woodstock.

I am afraid that our Chairman has led you to believe that you will receive something from me that I cannot give.

Before beginning my address, I would like to say that we have a live Horticultural Society in Woodstock. I regret very much that citizens of your town have not taken more interest in horticulture than they have. I expected to come here and see

a large display of house plants and foliage which would surprise the most of us people. I am somewhat disappointed in that respect. Our Horticultural Society in Woodstock has done a great deal there. It takes a very active part in our municipal affairs. Anything that we think is required for the beautifying of our city is easily supplied by our society. Anything that we think is going to be to the interest of the city in decorating any public grounds, the request is laid before the School Board or Council. By that means we have our public buildings and schools very nicely decorated with shrubs, plants and flowers. We also offer a very great inducement to our scholars at the schools. We distribute amongst the scholars a great many plants in the spring of the year, and bulbs in the fall. This last spring we distributed a great many plants and flower seeds to the scholars, and they were requested to bring plants and flowers to the fall fair, where we have an exhibition of flowers and plants, and they are awarded premiums in the shape of bulbs. This fall we have distributed a lot of bulbs to our scholars for the exhibits which they made at our show. We also distribute very largely to the members of our Horticultural Society. A short time ago we distributed nearly five thousand tulip bulbs to our members free of cost to them. So we are working along this line. Anyone who has visited Woodstock will observe that we have no fences there. Everything is open to the public. That all originated with our Horticultural Society. If we are not able to succeed in carrying out our schemes that we proposed to the Municipal Council, we make it very warm for them at the next municipal election. By this means we have been able to do a very great deal of good in the way of making our town beautiful.

I feel like congratulating ourselves upon the very favorable auspices under which we have met here this year, and to find so much enthusiasm manifested here in this meeting. Also to see so many ladies in the audience, which is very gratifying to us. It is our desire to cultivate those features in our meetings which will reach the ladies and interest them in the beauties of nature.

The subject of "The Coleus and other Foliage Plants" which has been assigned to me is one of great importance to all lovers of Floriculture. It may be regarded from so many different points of view, that it is difficult to say which should have priority of consideration. It must not be expected that I am going to enter upon this subject very fully, but will confine myself mostly to the Coleus and a few of the fancy-leaved and decorative plants and their treatment. And if my paper shall be the means of promoting one admirer of the beautiful and good to greater effort to make home more attractive by beautifying his or her home with a few Coleus and other foliage plants distributed here and there about the grounds surrounding the home, I shall consider myself well paid for my effort. No greater evidence of progress in fine arts can be produced than such careful attention to our home approaches as will make them most attractive. A large percentage of our men consider flowers and plants as only for the pleasure of women and children. But in the new order of things it is going to be different. Already men are waking up to a realization of the fact that they have lost a great deal by not having given more attention to floriculture. It is a good sign when we see a man helping his wife with the flower beds. We know that in a little while, he will take as much interest in them as she does.

Formerly the idea prevailed among florists, both professional and amateur, that each kind of plant required a special kind of soil, and many amateurs were prevented from making an attempt to grow plants because of the amount of labor which seemed necessary in preparation of the different kinds of soils. But of late years there has been a change of opinion; that one kind of soil properly prepared is sufficient to supply the needs of the majority of plants that can be grown in the house or conservatory.

Sand is a most important factor in successful floriculture, and the coarser and sharper the sand is, the better it is adapted to the purpose. For the majority of house plants, a mixture of leaf mould, or some good substitute, with garden loam is advisable,

because the vegetable matter of which it is composed is an important element of plant growth not to be found in clear loam. An excellent combination for the majority of pot plants is this: One-half loam, one-quarter leaf mould, one-quarter sand. By mixing these together well, you have a soil which nine-tenths of the plants adapted to house culture will thrive in. For fine-rooted plants leave out half of the loam, and double the amount of leaf mould or its substitute.

So much for the preparation for pot culture. If to be planted in the garden, well prepared beds with good drainage is all that is necessary. Having prepared the soil, etc., now the obtaining of plants. Everything must have a beginning, and domestic floriculture is not an exception to the rule. Plants must be procured. Full-grown plants can be purchased from the florists or accepted from friends, but it is far more satisfactory to have grown your own plants from seeds or cuttings.

There is a fascination in growing *Coleus* from seed. These showy plants are grown extensively for their brilliant-hued foliage, and used extensively in our large parks and lawns. Some of the new varieties are very beautiful, large, broad leaves of deep velvety coloring. These leaves will average six to seven inches in length, and nearly the same in breadth. In the new *Sunset* strain the surface of the leaves is heavily crimped, and the coloring is of a rich purplish tone, brightened by crimson veinings. The diversity of shades and combinations of color are so varied that it is hardly possible to find two plants exactly alike.

The New Gigantic Copper-leaved is a grand new variety, and comes so entirely uniform that the home gardener as well as the florist can grow a supply of plants for setting out a bed of these beautiful foliage plants to produce a solid color effect. The growth of the plant in this variety is strong and vigorous, with extremely large leaves. The ground color of the broad leaves is a deep golden yellow, heavily overlaid with rich reddish brown, almost as bright and velvety as the well-known *Verschafelt* variety. The rich, yellow ground coloring shows out clearly at the base of the leaves, and in a narrow margin around the edge, as well as in the under side of the leaf, it tones and enlivens the richer and darker coloring, and gives the distinct coppery tint from which the variety takes its name. They are so easily grown from seed, the seeds germinating rapidly, and the plants being of quick growth, can be easily raised in a small box with a pane of glass covering it, placed in a sunny window of a warm room in the month of March, or in a hot bed. In a few days the little seedlings come to the surface, and from day to day are changing color. What a delight it is watching them develop and wondering what colors each day will bring forth.

When a plant begins to wilt, and the foliage has a flabby, half-wilted look, and shows signs of ill-health, which cannot be attributed to lack of moisture in the soil, or too much heat and sunshine, it is safe to conclude that the trouble is at the roots, and an examination will generally show that some of the roots are diseased. The unhealthy condition may come from too much or too little water, or from worms, which often attack the young roots and sap them of their vitality. These generally come from using barnyard manure. Watering with lime water will drive out the worms, and will usually get rid of this trouble. Apply enough to each plant to wet the soil all through, and repeat if necessary. The soil being too heavy and without proper drainage might be the cause of the trouble.

One of the most troublesome pests the grower of *Coleus* has to contend with is what is known as the mealy bug. It is a flat, tender, yellowish insect, and is covered with a white, mealy substance, from which the common name is derived. It is very troublesome to *Coleus*, and many soft-wooded plants. Picking off the bugs with a small, sharp-pointed stick is the best and safest method of keeping down these pests, or spraying the plants two or three times a week with soap suds, to which has been added a little kerosene, say, two tablespoonfuls to a gallon of suds. A very effective way is by spraying with a little alcohol.

Coleus do better in cold frames, made specially for such purposes as getting quantities of young plants ready for bedding, as all of one growth can then be had.

It is well known that many tropical plants are extremely beautiful, and they invariably prove in the highest degree attractive. Those of the tropics excel in magnificence, and they are not, as a rule, difficult of cultivation.

Crotons. Nothing can excel the beauty and richness of coloring that is found in this class of plants. They are beautiful as pot plants for the conservatory, making handsome specimens for decorative and exhibition purposes, and are used as extensively as bedding plants. They should be planted in full sun, in a position where they can be liberally supplied with water, which develops the most wonderful colorings in the foliage. These plants should be grown rapidly, and confined to a single stem. The soil best adapted for them is peat and leaf mould in about equal parts, with the addition of a small portion of rich loam and some sharp sand.

The *Caladium* of late years has become one of the most effective tropical plants in cultivation for the flower border or for planting out upon the lawn. They also make grand plants in pots for the conservatory or greenhouse, and are becoming more popular every year. They will grow in any good garden soil, and are of the easiest culture.

Caladium Esculentum (Elephant's Ear) is a grand tropical-looking plant, a favorite for specimens on the lawn, or for show purposes, or for bordering large sub-tropical groups, growing from six to ten feet high, and bearing immense leaves three to four feet long by two and a half feet wide. To obtain the best results, it should be placed where it will get plenty of water and an abundance of rich compost. The fancy-leaved *Caladiums* have, in recent years, grown very rapidly in popular favor, not only for the decoration of the conservatory, greenhouse, and window boxes, but nearly all of these varieties succeed well if planted out of doors, when the ground has become warm, in partly-shaded, sheltered borders, in well-enriched, light soil. Their beautiful-shaped and glossy foliage is elegantly variegated in the most telling manner. Some are regularly dotted with round, raised spots of white. Others are ribbed and veined with pink, scarlet or yellow, while others again are splashed and marbled with white, or shaded almost black.

The *Ricinus* (or Castor Oil Bean). Large, luxuriant, rapid-growing annuals, with palm-like leaves; much used for sub-tropical effects on the lawn or for centres of beds of foliage plants. This summer I saw some *Ricinus* growing on Mr. P. Patterson's grounds in Woodstock measuring from the ground to the top sixteen feet ten inches.

INSECTS AFFECTING HOUSE PLANTS.

By Dr. James Fletcher, Dominion Entomologist, Ottawa.

It was announced that I would speak on Window Gardening, but, by a different and better arrangement, Mr. Hunt is to speak on that subject this afternoon. He is to follow me, so I shall not overrun my proper time.

The subject which I have to bring before you is a very simple one, and a very short one, but one which may be explained to any extent.

There are only three or four classes of insects which attack house plants. Those who grow roses, think that the aphid is the very worst insect they have to contend with, but all will not agree with them that this is the worst insect, because those who grow foliage plants of the genus *Coleus* and *Cacti* have more trouble with the mealy bug; so they say that that is the worst insect. In short, the worst insect is the one which gives each individual the most trouble, and there are several kinds of insects which attack house plants, each of which must be considered by itself. Now, all

of these different kinds of insects can be treated with comparative ease, if their habits are studied a little. House plants are a good deal like children, and the growing of house plants is much like the training of children. They have to be disciplined, fed, and kept clean. There is nothing which will keep children in better health than feeding them regularly and washing their hands and faces often; and plants are the same. Washing them at short intervals will keep them free of nearly all the insects which attack them indoors. No one can grow flowers who does not like them well enough, and does not get a good deal of pleasure out of taking trouble with them, which in a very short time will bear fruit in a knowledge of how to do things in the best way. Now, roses are considered by most people as very difficult to manage in the house, but our friend Mr. Race here is so fond of roses and has made such a success of growing them for a great many years, that he will tell us that there is no difficulty whatever in growing roses. This simply means that he knows how to do it. He will tell us that his greatest insect enemy is the Rose Aphis, and this is certainly a bad enemy, unless it is attended to.

One of the first things to consider when we decide to grow flowers in a window of an ordinary house is the extent of our window room; for, those who grow house plants most successfully, find that it is better to confine their efforts to a few plants and let those do their best, than to fill a window up with a great many plants, none of which have sufficient room to develop properly. The soil in which plants are grown must, of course, be considered. With proper conditions of room, soil, and moisture, anyone who is fond of plants, can get flowers at almost any time of the year; and, with the added knowledge of what to do when they become infested by injurious insects, he will have much more satisfaction in his labors. Let us suppose that we are growing roses, and some fine morning discover that they are infested with plant-lice. What shall we do to get rid of these enemies? There are for every kind of insect several different kinds of remedies, and what we want to find out in every instance is what is the simplest remedy for us to apply. Plant-lice are sucking insects, that is, they live upon the sap of plants, which they suck up through a hollow tube with which they have pierced the tissues of the plant, causing it to wither and die, because the sap is its blood. From a lack of knowledge of the structure of insects, many people use the wrong remedies when an insect appears. One of the commonest mistakes is for people to use Paris green as a remedy for plant-lice. Knowing that this material is very destructive to the Colorado Potato Beetle, they suppose that it will kill all insects; but this is not the case. The potato beetle is a biting insect, which devours the whole substance of the leaves; but a plant-louse lives only on sap, which it draws from beneath the surface of the plant, and thus never gets any of the poisonous Paris green into its stomach. For sucking insects, then, we cannot get any poison into the sap which they live on; we must use some remedy which will kill them by merely coming in contact with their bodies. Among the best of these are various kinds of soaps, to which may be added tobacco in various strengths; or the proprietary substances known as tobacco soaps, or nicotine soaps, may be used. Coal oil also is extremely useful, and, when emulsified with soap in certain well-known proportions, which I shall be glad to give to anyone on a printed slip if they will apply to me for them, may be used even upon delicate foliage without injury. For large greenhouses, perhaps the most economical treatment, although a rather dangerous one and requiring a great deal of care in its application, is fumigating with hydrocyanic acid gas, which is generated by putting cyanide of potassium into a jar containing sulphuric acid and water. All kinds of insects can be killed with this gas; but it must be remembered that so also can all animals, including human beings; therefore, this remedy must not be used in the dwelling house or by those who do not understand its danger. For the ordinary dwelling house we must use something simpler and something that is easily obtained. Perhaps the most useful substance for the ordinary flower grower is common laundry soap, and in those houses where the

occupants have been educated to an appreciation of a value of that most useful herb, tobacco, a little of that can be added to any mixture made. It will increase the content of the flower grower, but add very much to the discontent of the wicked insects who do not appreciate it. If anyone objects to tobacco, either as smoke or in a decoction, the soap alone, if used often enough, will answer. A most useful soap for all insect-killing work is carbolic soap, or tar soap. Another substance which will kill many insects and which is not objectionable to anyone, is pyrethrum insect powder, which is known in the trade simply as insect powder. This has a very curious fatal effect upon insects. You know insects are not quite like we are. We have one mouth, but an insect has a great many mouths. An ordinary caterpillar has nineteen mouths, one to eat with and eighteen to breathe with. The effect of this powder is that when distributed in the air it paralyzes the muscles which close and open these breathing mouths. They are closed up at once, and are paralyzed so that they cannot open again, and the insect dies of suffocation. It is well known that it is very destructive to house flies, when distributed in the windows. Every time they come to the window they come within the influence of a poisonous volatile emanation from the powder, which destroys them. Dusting rose trees covered with plant lice with the insect powder makes many of them drop from the plant, so that the washing with soap afterwards is very much easier.

There are no plant insects in houses which need to be poisoned with Paris green. This material is very poisonous, and it is not advisable to use it in a house. It is well to remember that Paris green is neither a necessity nor useful remedy for house use.

The next insect that I shall speak of is not an insect at all, and that is the red spider. The red spider practically is an insect, and is in no way related to the spider—it is a mite. When it gets on house plants, particularly in those houses which are over-heated, it is an exceedingly difficult pest to get rid of. There is one thing which will eradicate this insect, that is, sulphur. The sulphurous gas which is given off is fatal to them.

To remove scale insects of all kinds, give the plant a good washing. Put your hand on the top of the flower pot, put a piece of paper underneath, and spread your hand to hold the plant from falling out. Then turn it upside down, and with soap-suds give the plant a good washing. If it is a large plant like some of the cacti, or palms, washing is a very difficult matter. Then, you leave it standing in its pot and take a piece of flannel, which is about the best thing to wash a plant with. With ordinary soap you can wash off nearly all the scales which affect the different kinds of plants. If you get one of the carbolic or tar soaps they are much more effective than ordinary soap. All soaps are injurious to insects, and most of them are rather beneficial for putting in small quantities on the soil of your plants. The red spider is the most difficult pest to deal with, and if you have a plant, such as an annual plant, growing in your window, first of all consider, "Is it best to fight this or better to throw the plant away and get another?" for you can generally get, without trouble, some plants to replace those thrown away. Everybody who grows flowers is very fond of them, and you have only to admire them and the owners will want to give you a specimen or cutting of his plants. Therefore, ruthlessly destroy any plants on which the spiders have got such a hold that you cannot get rid of them. However, if the infested plants are such that you cannot readily replace, then trim these down very closely and wait till the new wood comes.

The next insect I will speak of which gives trouble in the window garden is the Mealy Bug. Upon examining it carefully we find that it is really a scale insect. It very frequently gets into the window garden on the Coleus, which is very difficult to wash, as washing spoils its velvety surface. It is also extremely difficult to clean the cacti of this insect, but we can only do the best thing possible under the circumstances. We must not attempt to rub the insects off, but rather find out how we

can get the material to destroy them on the plant, without destroying the plant. As you know, alcohol is a very injurious liquid, but you will find there is nothing you can clean a plant with more easily than a little clear alcohol put right down on the bodies of the insects. If they are thoroughly saturated, the alcohol will kill them. On Cacti this is best done by touching each of the Mealy bugs with the tip of a paint brush which has been dipped in alcohol.

Scales on palms are best washed off with soap and water. In growing palms in the house we give them two conditions which they do not get in nature: one is the dry atmosphere of the house, which is uncongenial to these plants. We must try and remedy this, and we can do so in a measure by putting water into the soil in the flower pots, and also by refreshing the foliage, sprinkling frequently and washing it. Another thing which is very seldom considered is dust. Dust is one of the worst enemies of house plants, because the dust chokes up the mouths of the leaves so that they cannot inhale their gaseous food. Then the leaves do something else beside breathing. They give off moisture from the plant. You give a plant plenty of water to drink. It takes in the water through its roots, and gives off what it does not require through the holes in the leaves. If dust settles on the leaves, they cannot perform their functions.

We can help the plants also by giving them fresh air. By giving them fresh air, of course avoiding cold draughts, you will give them more health than by all the fertilizers you can buy from dealers. By doing this, keeping them free from dust, and washing frequently, you keep off many of the insects.

A plant which will stand a good deal of knocking about is the Oleander, and on this account it is generally neglected a great deal. I have seen it entirely covered with a scale which changes even the color, and instead of that beautiful dark green, it is covered with a white, scaly surface. These scales are tiny insects, which are sucking continually from the sap of the plant. If we allow them to remain there, the plants will suffer and finally die. There are many things which Mr. Hunt will tell you that will dove-tail in with my remarks, because fighting insects on house plants is only one part of growing these successfully. One of the greatest advantages of growing house plants, I am sure he will tell you, is the great increase to our happiness which it insures. In fact, it keeps us all young, better than anything I know of. I am going to be a boy as long as I live. I think that the very best thing for all boys and girls to do is to have a hobby of some sort, and they are very happy boys and girls if they find their pleasure in growing plants and flowers. This relaxation, too, is for every one, whether they know that they are fond of plants or not. Let them but get some sort of a seed, plant it, and see first of all the little seed leaves, then the real leaves, and watch the difference between the seed leaves and the real leaves, then the gradual development, until their plant flowers, and I have never yet met anyone who could not get pleasure from the exercise, and give much more to others as well.

Q.: There is a great deal of dissatisfaction in using the hydrocyanic acid gas. Some of us are afraid to use it, claiming that some plants are injured by it.

A.: Dr. Fletcher, Ottawa: There is certainly great danger in using it, for this gas is the most poisonous gas known. One single inhalation is sudden death. It is too dangerous a thing for anybody to use without definite written or printed instructions, and no one should attempt to use it without these printed instructions before him all the time. It is a gas to be used only by those responsible people who would take the necessary care. These instructions are given in the Government reports, and they can be got from Prof. Lochhead, of Guelph, or by applying to me at Ottawa.

Q.: If you put lime with tobacco water to make it adhere to the plants, is it more satisfactory?

A.: I have never tried it to my knowledge, but it might have that advantage.

Q.: What would you do for scales on ferns?

A.: The only thing is to wash them off with tobacco soap if possible; or with tar soap.

Q.: Is it better to wash the soap off?

Yes, especially if carbolic soap is used. I generally leave it on about half an hour, then wash it off with clean water.

THE WORK OF OUR HORTICULTURAL SOCIETIES IN OUR TOWNS AND CITIES.

By A. K. Goodman, Cayuga.

The work of our Horticultural Societies depends largely on the individual enthusiasm of its members. The world has been full of great messages. There has been wonderful progress and development in literature and art, in all that is beautiful and good. The message of this society is to take up the work and receive in return better health, a new lease of life. Who are to be the messengers? The local societies that we have formed. After the message is well established it becomes the message to the individual. This is to join the local society, to improve your surroundings and get a home of your own. That means that you are to get up early and live a regular life. If you study nature, the first thing that strikes you is the system about it.

A lesson that the society needs is the lesson of co-operation. See that your town is in the front rank of improvement. Keep pounding away until you fairly make the council take hold and do something. It is pretty hard for one man to go to the council and try to get them interested. It is the individual member's duty to promote an interest by growing everything he can as well as he can, improving everything, and giving the world what he can. I do something like my friend, Mr. Race, and provide all my friends and my neighbors with boxes of flowers, and it looks as though I was in the business and expected a return for it. My return is improvement in my own character, and in my other lines of work.

The most important thing around the town is the drainage, and the horticultural societies should take very great interest in that, because on the drainage depends the health of the community. Water, like men, to keep out of mischief, must be always on the move. There must be no stagnant pools. The roads should all drain to their proper watercourses, the gardens should be drained, and everything about the property should be drained. The water should keep moving. You look in a man's back yard and see nature working out her system of irrigation. There is a dry spell, and the earth opens in cracks and fissures. The heavy rain comes, and away rushes all that fever and disease into the well, and soon a typhoid fever breaks out and a loved one is lost. All this because the man did not realize the message that was brought to him by the horticultural society. Another thing, it encourages thrift about the home. Many of the crimes of the age are due to idleness. You are very lucky in the neighborhood if idleness does not lead to drink or crime.

Coming back to the home, a good beginning is the planting of an asparagus bed, or the growing of a little parsley. Get a man started, and soon he will want to show his work to everybody.

Then go to the schools. We neglect our schools. Some of the trustees neglect the school building. They will not go into the building to see if it is properly lighted or heated, or the grounds laid out properly and the children given a chance to play. I was glad to see that in Toronto Junction they have spent \$12,000 in getting a playground for the school. In most cities they skimp the school grounds. If you do not begin with the children you might as well drop the work right now, because you cannot expect older people to break off their habits. You must get the children interested first.

Then go along the streets, to the different public places. The street is often neglected as to shade trees. They should exist for beauty, and for the protection of the pedestrian. Also they increase the value of property. Anything you make more beautiful

you make more valuable. People will like to come to the streets. Refinement and beauty do not exist only in immense buildings, for the humblest of homes can be made a bower of roses, and there is just as much refinement and culture as there is in a large home. Ruskin say that the character of a people is displayed in their architecture. That is not true in this country, where people have to take things as they find them.

Another thing that seems awful to me is the condition of the church houses and the churchyards. This is the fault of the clergymen. There ought to be more life in their sermons. A "Nature Sermon" from a clergyman who does not know anything about it falls flat. The church grounds should be models of neatness and taste.

The promenades is another thing that should receive attention. Attractive promenades will induce people to go out walking. The tongues get a great deal of exercise in this age, but the legs do not get so much. There should be more walking, more exercise.

Next as to the driveways. There is no excuse in this country why any man should not swim and shoot and ride and be pretty good at any kind of sport, and the driveways and promenades would encourage more of that sort of thing. I am a great believer in keeping up the driveways.

Another thing is the roads leading into the towns. Good roads are a great assistance in building up a town. I have known many towns to be stunted because the roads are not in good condition. Trade moves to the best centres of transportation.

The horticultural societies should encourage individual gardening by displays, premiums, and by teaching people of the work and how to do it. If there is any religion in a man at all, when he comes into the garden his nature becomes uplifted. He remembers that the Lord walked in the garden. The Lord walked in the garden of Eden. The Lord of Life walked in the garden of Gethsemane, and in the garden was a grave. Every man's life is a garden, and in every man's life is a grave. Man is the finest flower of God's creation; therefore, in your garden let there be order and beauty, and a constant striving to attain better results.

A very good idea is to go to the public gardens of our towns and rub shoulders with the gardeners, the people in charge, and find out from the practical men how they are doing things. It is simply wonderful the information you can get, and in many cases you can apply it to practical use when you get home.

The horticultural society has a general tendency to uplift the town. Canada is on the eve of a wonderful burst of opportunity. Now is the time for us to take the opportunity. People should spend money in uplifting the town, and the money spent on civic improvement is not wasted.

To come to our little town, Cayuga. We had one of the dirtiest and most miserable of towns. We started our Horticultural Society. Of course Mr. Beall is responsible for the whole thing. He started the machinery and pressed the button, and we have kept it going. We have cleaned up the two schools, planted hedges, and done wonderful things there. We have spent probably \$500 on these grounds since we started them. We have spent \$10,000 on cement sidewalks. We have new public gardens, and now each neighbor vies with the other as to who would have the best boulevard. The first thing we knew we had landed a factory, a leather goods factory, employing forty hands, which we never would have done if we had not started improving our town. And we owe it all to the Horticultural Society.

PALM CULTURE IN OUR HOMES.

By J. O. McCulloch, Hamilton.

In this paper, "Palm Culture in Our Homes," I can only give an account of the method pursued by myself. It may not be the best method, but it has resulted in some fairly good plants, and there is no doubt that anyone, with the exercise of

a little care and patience, can produce fine specimens of this most graceful and beautiful class in our ordinary living rooms; and I hope that those who have succeeded, perhaps by some different method, will give us the benefit of their experience.

It is unfortunate that many have been deterred from attempting to grow palms, by the somewhat widespread notion, that they will not do well in the house. This is a mistake, as there are few plants that will give as much satisfaction, with ordinary care as some varieties of the palm. They will grow and thrive where any blooming plant would prove a disappointment, because they do not require the sunlight which most other plants must have.

Palm culture, like everything else, must start by procuring the palm. Any florist can supply you, but it is not so easy to say with what variety to begin. If I were advising anyone to make a start, it would be with *Phoenix Reclinata* or *Phoenix Rupicola*. These two will stand almost anything, high temperature, low temperature, fluctuating temperature, coal gas (the less of it, however, the better), and even drying out until the leaves droop, and still maintain an appearance of which no one need be ashamed. Next in order would come the *Kentias*, *Balmoreaana*, *Forsteriana*, and *Canterburyana*, then *Lantania Borbonica* and *Seaforthia Elegans*, followed after a little experience by *Arecæ Lutescens* and *Cocos Weddelliana*; these last two are very graceful, the *Cocos* perhaps being the finest of all for table decoration. And now a word about buying the plant: content yourself with something of a rather small size to start with, and try and get a plant that has been grown in a cool temperature. If you get a plant that has been grown in a high temperature, the next few leaves it puts out, after having been removed from the greenhouse, will come with shorter stems than those already on the plant, thus destroying the symmetry so necessary in a palm. However, having possessed yourself of a plant grown in a high temperature, is no reason for discouragement, as each succeeding leaf, after the first one grown outside the greenhouse, will come on a little longer stem, and the plant in time resume its graceful shape. When buying, be sure your plants are well rooted, have them turned out of the pots and see that the tips of the roots are white or pink, and that there is a goodly number of them. A well-rooted, cool-grown palm may be safely removed from the greenhouse to our living rooms at any season of the year.

The first requisite of house culture is regular attention. Other plants may be injured by neglect and quickly recover, not so with the palm. The damage done by one week's neglect may require a couple of years to repair. By regular attention, I do not mean watering, or for that matter doing anything else at stated intervals, except looking your plants over at least once a day, to see what attention they need. There can be no stated time for watering plants. The temperature of the rooms may be higher one day than another, there may be more sunlight, the air may be drier; in fact, there are a variety of causes, not easily traced, which make it possible for a plant to require water twice in two days at the beginning of a week, and once in two days at the end of it. To be able to determine whether a palm needs water or not, is perhaps the most essential thing in palm culture, and easy as it is, it has proved a greater stumbling block than anything else. Constant soaking with water has ruined many palms, and drying out has probably ruined as many more. When you water, do it thoroughly, using tepid water if it is handy, and then watch your plant until it shows signs of becoming dry before watering again. You can tell this by the appearance of the earth in the pot, by the feel of it, or perhaps, best of all, by the sound produced by rapping the pot with the knuckles. To become familiar with this last method, take a pot filled with earth and let it become dry; rap it sharply with the knuckles and note the sound, then water it and rap again, noting the difference. Have a pot that was watered the day before, rap it and you will have still another note. With a little practice you will be able to tell by this simple method whether a plant needs water or not. The only rule to be laid down is, never allow the earth to become dry enough to powder between the thumb and finger, and never keep it

sinking wet. One of the best methods of watering is to place the plant in a pail or tub of water, where the water is deeper than the pot, and allow it to stand until the air bubbles cease to come to the surface; then, in taking the pot out, drain the water from the top of the pot so that as little water as possible will pass through the soil. The reason that this method is better than the one usually employed is that the earth in drying shrinks away from the pot, and when the water is poured in at the top it is very apt to find its way down the sides of the pot and out at the bottom, without having thoroughly penetrated the centre. You will also find that plants watered by this method do not dry so quickly, thus showing that the watering was more thoroughly done. And now I must sound a note of warning in regard to jardinières: they are all very well in their place, and certainly improve the appearance of a handsome palm, but they were never intended to water palms in. When you water your plant, take it out of the jardinière and allow it to drain before putting it back; and it is perhaps as well as a matter of precaution, to have an inch of beach gravel, or something of that nature, in the bottom of the jardinière, and when you lift your plant out, drain out any water that may have accumulated.

The next matter of importance is washing the leaves. To keep a palm in good order this must be done at least once a week, and at a time when the plant needs water. Perhaps the easiest way is to stand the plant in a bath or tub and give the leaves a shower bath with the watering can, or fill up the bath and put the plant in so as to cover the leaves, if necessary, placing it on its side. Should you prefer to have the leaves cleaner than these methods will make them, rub them over with a damp sponge, rinsing it occasionally. There is no necessity to use castor oil or anything else of that nature to make the leaves glossy if they are kept perfectly clean. Handle your palms carefully. The tip of the coming leaf in some varieties is very brittle; the slightest touch will break it, as I have found out to my sorrow more times than one. If you should be so unfortunate as to break one, don't feel too bad about it, as the injury is generally temporary, seldom affecting the leaf after opening.

With regard to temperature, a palm with proper watering will stand a higher or a lower temperature than we would find comfortable in our living rooms. It is a mistake to suppose that they require an extra amount of heat. They will grow and thrive just as well in a lower temperature, say from 55 to 65 degrees, and in the end make a better plant. A palm will stand, without injury, an occasional temperature of 45 degrees, provided it has not been grown in a high temperature, but it is not, of course, advisable to subject the plant to such an extreme if it can be avoided. As to light, give them a sunny window in winter if you can, but it is by no means a necessity; many palms that are fine specimens have seen little or none of the winter sun. Be careful not to give a full exposure to sun in the late spring, or the result will probably be unsightly burnt leaves. If your house is heated by a hot air furnace, be sure to keep the water pan filled, as much for the benefit of yourself as your plants, and avoid if possible coal gas, though palms stand even more of this than most plants. Should your house be lighted by gas, grow your palms in the room where least of it is used. Special ventilation I do not think is necessary, the air that is pure enough for us will be all the palm requires.

There is but one class of insects that is injurious to palms. These are generally known as scale, and you will have to learn to know them and keep a sharp lookout for them, otherwise your efforts at palm culture will come to naught. They appear as little greyish or brownish scales on the leaves, and will, if left undisturbed, render the finest green leaf a sickly yellow. Should you have them in any quantity, take a tooth brush and water and scrub the leaves until the scale has fallen off. If, however, your plant is free from these pests to start with, and you examine it occasionally, you will probably never find more than half a dozen or so, which may be removed with a little piece of stick, or anything else that comes handy. Never apply kerosene emulsion or anything else of that nature to your palms; it may kill the scale, but will certainly injure the plant.

And now, we may consider the soil and method of potting. I have grown palms with some measure of success in soils of widely varying nature; for instance, in rotted clay sod, then in leaf mould, and again in a mixture of the two, and I have found but one soil so far in which they would not grow, and that was rotted sod and manure. The lesson to be learned from this is, avoid manure in any shape for palms. Whatever soil you use, make leaf mould the basis of it. All my palms but one or two are growing in pure leaf mould, and the one or two are in leaf mould with the addition of about 25 per cent. fine beach sand. This latter soil is the better of the two; but I think the substitution of light rotted sod for the sand would be still better, provided there was no manure mixed with the sod. In case that any of you do not understand what is meant by leaf mould, I may say that it is simply thoroughly decomposed leaves, and can be found in any woods. Scrape away the rough leaves on top, and you will find your leaf mould from two to four inches in depth underneath. In using it, don't sift it or throw out the fibrous parts or little pieces of stick: let it all go into the potting soil. Another thing, do not take your leaf mould from a depression, where water might lie; select a spot that is well drained, otherwise your soil will be sour; in fact, it would be better to throw the leaf mould in a little heap, in cellar or outhouse, and turn it over a couple of times, to make sure it is perfectly sweet before using.

In potting, the first thing to be considered is drainage, and this must be perfect. To attain this end, I know of nothing equal to the method described by our President in his talk about bulbs. If you remember, he covered the hole in the pot with a piece of broken flower pot, then put in half an inch of beach gravel, and over this some moss or leaves torn to shreds. This is an improvement on any method I have used so far, and I intend to use it in future. Having provided the drainage, put in some soil, and then your plant, and remember one thing, pot tightly; take a flat stick and ram the soil down around the side of the pot; you will hardly get it too tight. Be sure the pots you use are perfectly clean, and use a pot an inch larger than the one the palm is already in. In some cases it may be desirable to put the plant back in the same pot that it is growing in. To do this take the plant out of the pot and stand it in a pail of water, washing all the earth from the roots; then put it back in the pot, and with the fingers ram the new soil in between the roots until the pot is full. This is rather a delicate operation, and I would not advise anyone to try it extensively without first experimenting, though it proved a success with me in the case of two plants last spring. The best time for an amateur to pot palms is in spring, probably the latter end of May, and one shift a year is plenty for all palms, though some of them may not require potting as often. It all depends on how the plant is growing. Learn to turn a plant out of the pot without disturbing the soil, and keep track of the condition of the roots; in health, the tips should be light in color; if black and soft, something is wrong. The trouble may be too much or too little water, the one who waters the plant is the only one who can determine which. When turning out the plant if you see a worm take it out, but it is doubtful whether they do any harm or not. Should you wish, however, to get rid of them, try watering with lime water, or stick half a dozen matches in the pot, sulphur end down, and leave them there through two or three waterings, and the worms will come to the surface.

Palms will probably be the better for staying out of doors in warm weather. Certainly they are more easily looked after, but they must not be fully exposed to either sun or wind; the sun will burn, the wind thrash and split the leaves. The ideal spot is one with the wall to the south and west; in such a position the plants get three or four hours sun in the morning, and are protected from the prevailing winds. Another good place in summer would be a sunny position, where they could be protected by cotton stretched along the sides and over the top of them. In this position they would make a more rapid growth, but would require careful watching; the

slightest drying out would result in injury. In summer I have always watered my palms with the hose. There is no doubt that tepid water would be better, but the hose was so much the handier that it outweighed all other considerations. Take your plants in when the nights get cool, and put them out during the day. You can give them all the sun they can get at this time of year without fear of injury, but beware of the wind.

In recommending varieties of palms, I have confined myself to personal experience, and there are no doubt many others of which I know nothing that would do equally well in the house. There are also some other plants which cannot be classed as palms, but which are of the same decorative nature. Chief among them stands *Pandanus Utilis*, the screw pine, which does well in the house, but should not be subjected to as low a temperature as palms will endure, and will come a much better color if grown entirely in the shade. *Pandanus Veitchii* is a variegated form, green and white, but seems to run to a solid light green, and is not so desirable as the other. *Ficus elastica*, *Cordyline indivisa*, *Araucaria excelsa* and many greenhouse ferns make fine decorative plants, and will grow well in the house. One word, in conclusion, to those among you who may have bought palms and seen them die or become so unsightly as to be an eyesore rather than an ornament. Do not be discouraged and conclude that palms will not grow in the house, rather try and find out wherein you have gone astray, and thus get the benefit of the experience that has cost you so dear. Remember one thing, look your plants over every day. It will take but a moment or two, and you will be surprised to find how their needs vary with the varying conditions surrounding them. That palms can be grown in ordinary living rooms as well as in greenhouses I know to be a fact. I venture to state that I can find many palms that have not been in a greenhouse in years, that, size for size, will hold their own with any plants grown under glass.

• DECIDUOUS SHRUBS.

BY RODERICK CAMERON, NIAGARA FALLS.

I have often considered the want of a reliable list of the best, most floriferous, useful and hardy deciduous shrubs a great drawback to the general planter of such stock; hence my reason for compiling this list, trusting it may serve a good purpose. It will certainly save busy people from turning up hundreds of varieties in the different catalogues and journals when if not familiar with the varieties, they are very apt to be led astray by the glowing descriptions given, and those unfamiliar with shrubs are apt to be confused with their great number, so many of them being so alike in appearance. Another mistake too often made in catalogues is their silence as to the hardiness of plants, and the silence of our journals in not condemning such, so saving the unwary from spending their money in useless stock. Farmers are generally ridiculed for not planting trees, shrubs and hardy plants about their houses; they are not all bred gardeners, why then not tell them the varieties to plant? Why not give good prizes at our large exhibitions for collections of such stock, and have them named? I think that a prize offered by the government for the best named collection of trees, shrubs and herbaceous flowering plants would be of untold value to the country by educating the farmer and the mechanic as to what to plant. I hope the following list will be found to fill the bill, and as to the names there is nothing here mentioned that will not do well in Welland or Lincoln counties.

1. *Berberis Thunbergii*. From Japan, about 3 feet high, one of the best dwarf shrubs in cultivation; flowers yellow, in drooping racemes followed by red berries in the fall and continuing well through the winter; no collection should be without the Japanese berberry.

2. *Berberis var. purpurea*. A purple-leaved variety of our native *Berberis vulgaris* ; will grow to 8 feet high and is a beautiful object as a specimen plant on the lawn or as a hedge plant ; a hedge of this plant looks well throughout the summer, and well into the winter after the leaves fall, with its quantities of berries, particularly if planted on poor sandy soil. The fruit is much prized by the partridges, and is equal if not better than cranberries to eat with turkey at Christmas if canned before getting frozen. My experience is that the purple variety does not fruit as freely as the native variety *B. vulgaris*.

3. *Caryopteris mastacanthus*, or Verbena Shrub. About 3 feet high, blooms from September until cut down by frost. This shrub is a grand acquisition ; it is one of the prettiest



ELEAGNUS LONGIPES.

flowering shrubs that I know of, the flowers resemble heliotrope ; it blooms in the axils of the leaves and all along the stem ; the leaves are very pretty light green above and very silvery on the under side ; the whole plant has a beautiful odor. If this plant proves to be hardy, there is no plant will give as much pleasure ; there are two colors, blue and white.

4. *Chionanthus Virginica* (White Fringe). This will grow from 5 to 8 feet high in rich deep soil ; is also a hardy gem, producing racemes of white fringe-like flowers about the first of June, followed by purple clusters of fruit, like grapes in the fall.

5. *Corylus var. purpurea*—(Purple-leaved hazel). This plant is by all odds the best purple foliage plant for general purposes we have and very hardy ; it is very showy at a distance. It will grow to 10 feet high, but can be kept dwarf by trimming.

6. *Daphne mesereum* (*rubrum* and *album*). This should be in our collection of shrubs from the fact that they are the earliest flowering shrubs that we have, and of very sweet perfume. This plant is a native of Niagara Falls and is very hardy ; flowers before leafing out ; it grows to a height of 5 feet.



EXOCHORDA GRANDIFLORA.

7. *Deutzia crenata*, single white. Will grow to 7 feet high : all the deutzias are beautiful shrubs, and we cannot afford to leave all of them out of the list.

8. *D. crenata flore pleno*. Double pink flowers in racemes in the month of June, 8 feet high.

9. *D.* (Pride of Rochester). Double white tinged with pink, a very beautiful variety, but I think it a little tenderer than the last. This one is useful for florists' work, to cut from.

10. *D. gracilis*. This one is of a dwarf bushy habit, very hardy, pure white, single flowers in racemes completely covering the plant, good to force in the greenhouse, also good to cut for florists' work, will flower in May ; about 4 feet high ; will flower at Easter when forced.

11. *Eleagnus longipes*. Silver thorn of which there are several varieties ; this one has the most beautiful foliage of a greenish white above and a silvery white on the under side, which shines in the sun.

12. *Eleagnus umbellata*. The female plants of this variety are a grand sight to see when in fruit, the leaves are silvery white like the rest of its class ; the fruit is eatable, of a reddish

amber color about like currants in size ; flowers small and yellowish, not showy. Plants can be kept down by trimming to 7 or 8 feet in height.

13. *Euonymus Europoeus* (European strawberry tree). This shrub will grow to about 10 feet in height ; should be kept as a single specimen plant, which makes it more attractive when bare of leaves in the fall ; about the first frosts the seed pods begin to open, exhibiting their strawberry-colored seeds which remain on the plants all winter, making them pretty objects standing among the snow ; flowers small, chocolate color.

14. *Exochorda grandiflora*. From China, hardy here, a most beautiful shrub, bearing white flowers in clusters, very showy, about 6 feet high—one of the best.

15. *Forsythia Fortunei*, var. *suspensa*, and var. *viridissima* (Golden Bells). From China ; the three varieties are hardy here, in bloom end of April or first of May ; a grand shrub covered with bright golden bells before leafing out ; blooms here the second time in the fall.

16. *Halesia diptera*, and *H. tetraptera* (Silver Bells). This plant becomes a mass of white bell-like flowers, will grow to small-sized trees, 10 or 12 feet high ; there is no plant prettier when in bloom about the middle of May ; blooms before the leaves expand ; belongs to Southern States.

17. *Hibiscus syriacus*—*Althea* (Rose of Sharon). It will grow to 10 feet high ; extremely useful on account of their late flowering ; they bloom profusely at a season of the year when

but few shrubs are in bloom, 1st August. There are double and single flowering varieties. The following will be found as good as any.—*H.* var. *Carnation*, double white striped red ; *H.* var. *Cœrula*, double blue ; *H.* var. *Lady Stanley*, double white, tinged pink ; *H.* var. *Variegatus*, leaves beautifully variegated.

18. *Hydrangea paniculata grandiflora*, grows from 5 to 6 feet, but should be kept cut back to within 4 or 6 inches of the old stem or trunk each spring, and only leave four or five of these short stems to have large panicles of bloom ; a long-lived healthy plant, blooming in August and September ; from Japan.

19. *Hypericum Moserianum* (St. John's Wort). Grows to about 3 feet in height, a very desirable hardy shrub, producing yellow flowers 2 inches across from July to fall ; native of America.

20. *Ilex Verticillatus* (Deciduous Holly). 5 to 6 feet high. I met with a plot of these shrubs lately in our own woods, and I thought them one of the most beautiful sights I had seen for a long time, the plants were literally covered with bright



MOCK ORANGE.

red berries, the ground being covered with snow make them look all the brighter ; they last all winter ; flowers small, white in July.

21. *Ligustrum*, var. *tricolor* (Privet). This variety I would recommend on account of its beautiful variegated foliage, a very pretty sport of the common Privet.

22. *Lonicera* (Bush Honeysuckle). Turkestan. *L. var. candida*, 8 to 10 feet, white flowers in end of May.

23. *L. var. fragrantissima*. This a Chinese variety, greatly admired for its very sweet-scented pinkish white flowers which appear early in spring.

24. *L. var. grandiflora* is probably one of the best of all, much larger pink flowers than the type, blooms in May.

25. *Paeonia Mouton* (Tree Paeony). 3 to 4 feet high ; slow growing, but when matured will agreeably surprise the owner by the large rosy pink double flowers it produces in profusion ; requires rich soil.

26. *Philadelphus* (Mock orange). Southern United States. *Philadelphus grandiflorus* is one of the best, 10 feet.

27. *Philadelphus var. aurea*. Is a golden leaved variety of the preceding one, and of a dwarfer habit, good.

28. *Prunus Pissardi*. 8 to 10 feet, a grand purple-leaved large shrub or small tree, retains its color until the fall, a valuable plant for color.

29. *Pyrus Japonica* (*Cydonia Japonica*). Japanese Quince, or Burning Bush, too well known to need description, 5 or 6 feet high.

30. *Rhus cotinus* (Mist or Smoke Tree). 8 to 10 feet, bears large panicles of mist-like flowers in June from which it derives its name, native of United States.

31. *Sambucus* (Elder) var. *aurea*. A golden-leaved variety of the common elder, a showy plant for color effects ; 6 feet high.

32. *Spiraea*. The spiræas are very desirable shrubs in all shades of color, double and single flowers. They grow from 2 to 6 feet high ; there are about 49 varieties that I am acquainted with. The following are about the best :

33. *S. bumalda*. 2 to 3 feet, one of the best of the newer sorts, flat heads of rosy pink flowers.

34. *S. Anthony Waterer*, 2 to 3 feet, a continuous bloomer all summer ; a sport of the preceding one, crimson flowers.

35. *S. callosa*. 3 feet, pink flowers, and continues in bloom a long time, hence its value.

36. *S. callosa variety*. A white variety the same as the preceding one.

37. *S. punifolia* (Bridal Wreath). Too well known to need description ; 5 feet high, double white flower.

38. *S. Reevesii*, var. *flore pleno*. 3 to 4 feet high ; a very beautiful variety bearing double white flowers about the size of daisies, one of the best ; in bloom about first of June.

39. *S. Thunbergii*. 4 feet ; this one has single white flowers in two to four all along the young wood and preceding the leaves, very pretty ; in flower about the first of May.

40. *S. Van Houttei*. This one when in bloom would mind one of banks of snow ; a grand variety ; also makes a pretty hedge, 4 feet high.

41. *Symphoricarpos*. (Snowberry) var. *vulgaris*. This one bears red berries ; very pretty in the fall.

42. *S. racemosus*. Bears white berries, otherwise like the preceding one, both are nice planted together.

43. *Syringa* or lilac. The lilacs are too well known to make any comment upon them, suffice it to give the names of a few of the best, and will begin with the Persian varieties, which are dwarf, growing to about 8 feet high ; they have small leaves and are profuse bloomers ; *Syringa Persica* (Persian lilac) flowers light purple.

44. *S. persica* var. *alba*. The white form of the preceding ; both are good to plant among some of the larger varieties.

45. *S. vulgaris*. This is the common garden lilac, 10 feet high, purple flowers.

46. *S. alba*. A white form of the above. Both are as reliable as any of the newer ones, of which there are a great number.

47. *S. var. Comte Horace de Choiseul*. Reddish lilac, and double flowers.

48. *S. Charles the 10th*. 7 feet, very good purple.

49. *S. vulgaris Marie Legrange*. 4 feet, a dwarf form, with large white panicles, very good.



AFRICAN TAMARISK.

for any lawn, grows to 7 feet high.

50. *Tamarix Africana*. Grows to 8 feet high has small pink flowers, in slender racemes, which appear towards the end of May or the first of June ; the foliage is small and heath-like ; makes a good green for bouquets.

51. *Tamarix Indica*. 6 feet high ; blooms at the end of August or first of September, of a brighter rose color than the above variety, A few plants planted together of the tamarisk makes a fine display of which the bees are very fond.

52. *Viburnum Plicatum*. 6 to 7 feet, Japanese snow ball ; this is one of the best shrubs in cultivation.

53. *Weigelia* or *Diervilla*. (var. *rosea*). One of the best, and flowers the second time in the fall.

54. *Weigelia candida*. Pure white variety of the above.

55. *Weigelia Desboisii*. Dark rose color.

56. *Weigelia variegata*. A variegated-leaved sort, all are grand shrubs

HARDY PERENNIAL PLANTS OF THE BEST AND MOST USEFUL VARIETIES FOR ALL PURPOSES.

BY RODERICK CAMERON, NIAGARA FALLS.

My intention for making up this list is that any person may choose varieties suitable in height, color of bloom, etc., to suit any situation, large or small. All of the journals and catalogues of perennials are very confusing to the inexperienced lovers of these beautiful flowers. It has been well said that the earth wears a crown of floral beauty, and among the brightest, richest, and sweetest are the hardy perennials ; they fill a place in our gardens and in our hearts which nothing else can supply ; like flowering shrubs when once planted they are a thing of beauty for a life time. What is more cheerful or more beautiful than the clumps of Phlox, Lilies, Irises or Pæonies that our fathers, mothers or perhaps our grandmothers planted. If people owning their own homes would only buy of the following assorted varieties of perennials, in place of wasting their money year after year in annuals, the same money that

is spent in these flowers that only last a season and are gone, would, if put to the buying of the following perennials, secure this full collection in a few years, and, if properly planted, would be an everlasting beauty to any home and the community in which they were planted. A list of this sort by some person familiar with the best of our hardy perennials, hardiest and best shrubs, and most decorative trees, and I may add our fruiting trees, has been a long felt want. What do we find? In all our journals there are hundreds of varieties of perennials, shrubs and fruiting trees that are of no value, some have never been of any value. Our fruit catalogues seem to be vieing with each other as to which can supply the greatest number of names, such lists particularly in fruits has been to a great extent very detrimental to the well being of the most of our orchardists, and we can see the bad effects of these lists in our orchards all over the Province. The beauty of a good collection of perennials is unexcelled by any other flowers; they have cheered many persons through dark hours of life; they were loved and planted by dear ones whose voices and presence are no more; their blooming calls to our minds happy days and faces that are gone not to return. There are many cheerless looking homes in our rural districts that could be made ideal abodes, with very little money, by judicious planting of the commonest of herbaceous plants and shrubs from the woods, if the few dollars could not be spared to buy of the list named below. Let us plant of these old friends of our forefathers, that I am glad to say are fast becoming great favorites with the flower-loving people of the world. There cannot be mistakes made in selecting from the following list, as every one of those mentioned is first class, chosen from among hundreds of varieties.

Achillea ptarmica flore pleno. Double sneezewort (northern hemisphere), height, one foot; in bloom all summer; flowers small, white and double.

Anthemis tinctoria. Kelway's hardy golden Marguerite (Europe), height, eighteen inches; blooms in end of June; flowers large yellow.

Aquilegia or Columbines. There are many of these in cultivation in every shade of color, and in doubles and singles, short and long spurred; there is also the well known native variety *Canadensis*. They range from eighteen inches to three feet in height, and are indispensable for the hardy border, ranging in bloom from June to September.

Aster amellus. (From Russia), height, eighteen inches; blooms from July to fall; flowers large and purple; very good for cut flowers.

Chrysanthemum uliginosum (Pyrethrum). Showy white flowers two inches across, four feet high, in bloom August to September, fine to cut.

Coreopsis lanceolata and *Grandiflora*. Leaved tick seed (United States), height, two feet; flowers large yellow; in bloom all summer if the seed pods are kept off.

Delphinium or Larkspurs. There are many shades of color and varieties of this most beautiful and useful plant. No garden should be without some of them; they vary in height from two to six feet.

Doronicum Caucasianum. Caucasian Leopard's bane (Europe). Height, one foot; in bloom in May and June; a grand early perennial; flowers large yellow.

Gaillardia grandiflora, or Blanket Flower. (North America), height, eighteen inches; flowers large violet blue and yellow, they can be had in several varieties, flowers good to cut; very desirable plants.

Gypsophila paniculata. Infants Breath, (Europe). Height, eighteen inches; in bloom July and August; it bears myriads of small white single flowers, if cut and dried will last for a long time, good for bouquets.

Helenium grandicephalum striatum. Flowers striped, yellow and white variety. *Autumnalis* is a native of Canada, the same height as above variety, two feet. Variety *grandiflora* grows to the height of six feet; the last two named varieties have yellow single flowers in the greatest abundance; the three are good border plants and good to cut for large bouquets.

Helianthus multiflorus flore pleno. (Dahlia Sunflower). Native of United States; height four feet; blooms in August; flowers large yellow and double, a very useful perennial.

Heuchera sanguinea. Alum root. Native of Mexico; height, eighteen inches; blooms in June; flowers scarlet, very showy and useful to cut. This is one of the brightest perennials in cultivation. There is also a white variety.

Hemerocalis Dumortieri. Japan day lily; height, two feet; a gem for the border or for cutting; soft rich yellow, exterior bronzy yellow or orange.

Hemerocalis flava. Golden yellow, fragrant day lily, (Europe), good for cutting, about three feet high, one of the best.

Hemerocalis Thunbergii. Bright yellow, three feet high; very fragrant; as this one blooms long after all the other day lilies have finished, it adds much to its value as a cut flower. There are two double varieties, and one variegated foliage; all are worthy of trial in the herbaceous border, (Europe).

Hibiscus Moscheutos. (Ontario Rose Mallow) height, three feet; blooms in August. The hybrids called Crimson-eye are magnificent plants; flowers nine inches in diameter, white with large crimson eye, and all pink in others; from two to five feet high; August and September, very fine.

Iberis sempervirens. Evergreen candytuft, (Candia), height, one foot; in bloom in June; white, a little fragrant in large clusters and flat, good to cut.

Iris germanica. German Iris, (Europe), height, two to three feet; there are many shades of color in the Iris; they are large, showy, very desirable plants.

Iris Kaempferi. Japanese Iris (Japan), height, two to three feet; the flowers of this iris are equal to the most beautiful orchids in many colors and varieties.

Lilium auratum. (Japan), height, four feet; blooms in July, is better of some protection in the winter, this is a very large and the most beautiful of all the colored lilies.

Lilium speciosum. Var. rubrum and var. album, are hardier than the above and are very fine lilies, bloom in August. (Japan).

Lilium longiflorum. A grand long. white, bell-flowered lily, increases fast, one of the best; height two feet.

Lilium candidum. (Japan), pure white; height three feet; very hardy and free blooming variety, grand to cut, all perfumed.

Lychnis splendens. Double Red, London pride, (Europe).

Lychnis semperflo. Pink, small flowers in abundance.

Lychnis vespertina. Double white; about two feet high; the above three varieties are the pink of perfection of what a perennial should be; grand to cut.

Paeonia officinalis. (Europe), height, three feet; I have about sixty varieties of the paeonia growing in all shades of color, in bloom June and July; one of the best border plants, grand to cut, very showy, requires deep rich loam soil.

Papaver nudicaule. Iceland poppy, (northern hemisphere), eighteen inches; color orange yellow and white; double and single, bloom in June. The Oriental variety is very beautiful, nine inches in diameter, scarlet with black eye, grand if planted in deep rich damp soil (Asia), three feet high.

Phlox decussata. Hybrid perpetual phlox (United States), height, three to four feet; in many colors, grand perennials, in bloom July and August.

Platycodon grandiflorum. (Chinese Campanula), China and Japan, height, two feet; in bloom July and August; there is a white variety, alba, also double; both are first class perennials.

Pyrethrum uliginosum. Sometimes called chrysanthemum uliginosum. Great Ox-eye, (Russia), height, four feet; in bloom August and September, makes a grand display, white.

Rudbeckia laciniata. Golden Glow, (United States), height, six to eight feet; blooms in August and September; flowers yellow, double and in great abundance, a grand plant for the back of the border and for cutting.

Spiraea. There is a number of varieties of the herbaceous spireas, and there are no plants more beautiful when in bloom, grand to cut for any purpose; there should be more of these plants used when they become better known; the following are probably the best: *Spiraea aruncus*—Three to four feet long, feathery panicles of white flowers, a grand variety. *Spiraea astilboides*—This one is also a grand perennial, a good bloomer; height, three feet; feathery white flowers, useful for forcing. *Spiraea astilboides floribunda*—A superb variety, dwarfier and blooms white. *Spiraea chinensis*—"Astilbe" (China), a grand acquisition for the border, a robust grower; three feet high; white triangular plumes, tinted with pink, excellent. *Spiraea Japonica*—Good for the border or for pots to force; two feet; white. *Spiraea Japonica aurea reticulata*—A variegated form of the ordinary variety, green leaved, veined with yellow, very pretty; two feet; white flowers. *Spiraea compacta multiflora*—A splendid variety for pots and the border; immense white plumes, robust grower; three feet. *Spiraea filipendula plena*—A beautiful double-flowering variety, very neat fern-like foliage, one of the best and neatest of this class; eighteen inches. There is also a single flowering variety of the last. *Spiraea palmata*—(The Crimson Meadow Sweet) Flowers crimson, very showy large panicles; three to four feet; one of the best. *Spiraea palmata alba*—A snow-white variety, very fine; three feet. *Spiraea palmata elegans*—This variety has pale rose-colored flowers, very fine; three to four feet; one of the best.

NOTE.—All the above are deserving of cultivation; they are very easily grown and grand to cut for bouquets; most of them were raised in Europe.

Statice latifolia. Sea lavender, (Bulgaria) fifteen inches; good to cut, will last a long time if dried; blue; very fine herbaceous plant.

Yucca filamentosa. Adam's Needle, this variety is hardy, and flowers beautifully in the counties of Welland and Lincoln. They are imposing objects, they grow from six to seven feet high when in bloom; flowers white, lily like.

Lythrum Salicaria. (Spiked Loosestrife). Niagara Falls native plant, very good perennial; three feet high; blooms all summer, flowers reddish purple.

Anemone Japonica—or Wind Flower. Height three feet, (Japan). There is a number of varieties of this beautiful late flowering plant, but this one which is white and its sister variety *rubra*, red, is the best for common cultivation; flowers in September and until cut down by frost: the red one is only two feet high.

Chelone coccinea. A charming plant; two feet; red flower; very showy, good to cut.

THE HARDY PERENNIAL BORDER.

BY A. ALEXANDER, HAMILTON.

The subject of hardy herbaceous plants and their use in the ornamentation of private grounds and public parks has received a good deal of attention during the past few years, and the numbers of new species and varieties of these plants suitable for the hardy perennial border are being multiplied at a rapid rate.

The earliest and sunniest recollections I have in connection with flowers, hover over the borders and beds of my childhood home, which were filled exclusively with old-fashioned perennials. There were lilies stately and tall in large groups, great masses of Sweet William, primulas in endless variety, scarlet lychnis, saxifraga, phlox, pæonies, hollyhocks and lots of others too numerous to mention. These were all interesting as they one by one opened their blossoms in the floral procession, but to me there was and is still in the yearly miracle of their re-awakening, in watching the tips piercing the soil, in their varied modes of unfolding their first leaves with such a variety of colour too, from the tenderest green to deep crimson, an

added pleasure not derived from ordinary bedding plants. I consider this a strong argument in favour of the cultivation of these hardy flowers that they afford so much joy in watching their yearly appearance as soon as the icy grasp of winter is relaxed.

While I do not say that hardy perennials will ever take the place of ordinary bedding plants for the decoration of public or private parks or grounds, or can be used so as to secure the striking colour effects secured by the geranium or coleus and others, still I assert that any one possessed only of a small garden or whose acres are filled with beautiful flowers of the hardy sort, can have from early spring to autumn frosts, a continuous succession of bloom.

We can have them suited to every situation, sunshine or shade, and to nearly every kind of soil. Not only so, but when once established in our gardens they stay with us forever if we are fairly good to them, increasing in bulk and beauty from year to year. We have them gay as the oriental poppy, and showy as the pæonies; while many of them are excellent as cut flowers, as the single and double flowering pyrethrums, so many beautiful hybrids of which are being introduced. Need I name the Iris family with its varied classes all exquisitely beautiful; the aquilegias in infinite variety, from our own native variety to the Rocky Mountain one with its heavenly blue and immaculate white, so blue and so white, as if it had been painted when gazing into the azure from its Rocky Mountain home; the campanulas, all dainty and general favorites; the larkspurs too, giving us color and stately growth from pure white through every gradation of color from blue to red. Many of these hardy plants are very fragrant, such as the sweet valerian and many others quite as hardy.



WHITE CAMPANULA, IN MR. ALEXANDER'S GARDEN.



DICENTRA CANADENSE, AT MR. ALEXANDER'S.

I have no intention of wearying you with lists of names of these hardy plants. The best and most useful list that I have seen is that issued by the Experimental Farm at Ottawa, consisting of 100 varieties and compiled by Mr. Macoun, the horticulturist there in 1897.

Just a word about the border itself. Hardy perennials I find thrive best in good ground with lots of rotted leaves worked into it. The thrift of the plants in such soil is so marked as to well warrant them getting it.

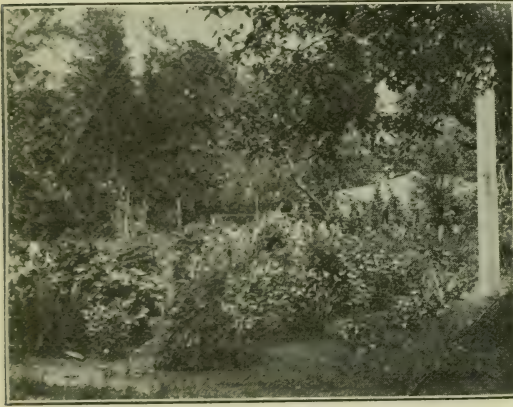
These plants, many of them at least, increase so fast and spread so much that

they require to be lifted, divided and replanted every three or four years. Some of them, such as the perennial phlox, so exhaust the soil in their immediate neighborhood that they are better if their position is changed every two years. The peonies and some others are better not to be moved. Every fourth year I trench my perennial borders. I proceed as follows: I take out a trench two spades deep and two spades wide, wheeling the soil to the other end where the operation will finish. I then mark off another space equal in width to the trench made and with my spade I take off about two inches of the top soil and throw it into the bottom of the trench; on this I put a good coating of fresh manure, tree



IBERIS GILBRATIC, (CANDYTUFT.)

leaves or the product of a rubbish heap of vegetable matter of any kind, then I throw upon this a spade deep of the earth from the second trench, on the top of this I spread some well rotted manure or humus of any kind, then on this I throw up another spade deep of the soil left in the trench; when this is done we have a second trench, the same depth and width as the first, and so I proceed until I reach the end of the border, where I find the earth taken out of the first trench to fill up the last with, its two layers of manure or other enriching material sandwiched twice. You will see that this really means the turning upside down of the whole border to the depth of about 18



HARDY FLOWER BORDER, AT MR. ALEXANDER'S.

inches and enriched with two layers of manure, one near the bottom one and one midway up. The reason of putting the fresh and unrotted manure in the bottom and the other higher up is that the plants when replanted will find out and get the benefit of the higher layer of manure the first year, and by the time the roots get down to the lower it will be so decayed that they can appropriate it to their strengthening and beauty, and can bid defiance to hot summers and other adverse surroundings for they are feeding on unseen supplies of food and moisture.

Planting is best done in the early spring. It is better to have good clumps or masses of the best of these perennials than to have



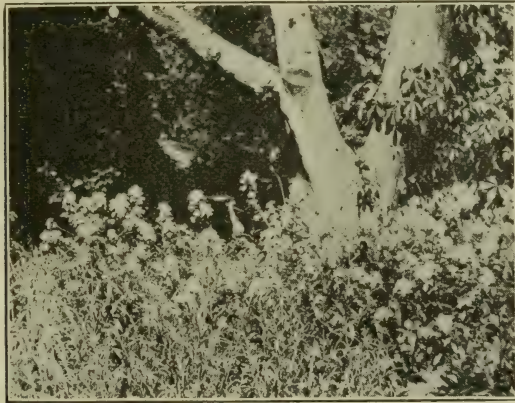
HARDY FLOWER BORDER IN GARDEN OF
MR. A. ALEXANDER, HAMILTON.

little bits of everything you can lay hands on if the ground is limited in extent. I would recommend a very liberal planting of the hardy bulbs, not lilies only, but the scillas and chionodoxa, the snowdrop and crocus, and the Narcissus family should be fully represented. The scillas and the Glory of the Snow, are most satisfactory and never fail to cheer the border, for they increase and improve from year to year.

I make a liberal use of many of our native plants. What more satisfactory than the trilliums, the hepatica and the blood-root to brighten the border with their pure white and azure blossoms, and the phlox divaricata makes a fine mass of purple lasting for weeks, and many others. Many species of asters are invaluable in the fall months.

We sometimes hear the complaint that a perennial border is an unkempt and unsightly affair as compared with the trim beds filled with greenhouse plants. It is, if not cared for. Plants needing support should have it early, and all flowers that are done blooming should be removed and the soil between the plants kept stirred from time to time.

I hope to see some of the commercial horticulturists of Canada go into this business and present us with a catalogue of these hardy plants as extensive as those issued on the other side of the line. And it would be well, if the commissioners of public parks gave this matter some attention and planted borders of these perennials all labelled so that the public could see for themselves and choose for their own gardens and be instructed as well as interested. Much



ROCKET, (VERY FRAGRANT), SHOWING THE EFFECT OF MASSES, AS COMPARED WITH SINGLE FLOWERS, AT MR. ALEXANDER'S.

more might be said on this subject, but I must close. I therefore urge the more general cultivation of hardy plants. It is interesting to watch their development, because there is a touch of home in the coming of the truly hardy varieties of flowers that seems to defy all kinds of abuse and quickly respond to good care, and we watch for them as eagerly as the seasons come and go; because the first cost of them is less than the tenderer and more aristocratic bedding plants; because of the greater variety and the longer flowering period we can have each year by their use; and they are less trouble than the more tender sorts and increase from year to year.

DIGITALIS PURPUREA (FOXGLOVE).

BY A. ALEXANDER, HAMILTON.

"An empty sky—a world of heather,
Purple of Foxglove—yellow of broom."—*Jean Ingelow.*

Thus the gifted poetess quaintly but truthfully paints the moorlands in many parts of the Motherland. No tree to break the skyline—the beautiful heather everywhere, only broken

here and there by patches of the yellow broom. It is there that the stately foxglove, the subject of this brief sketch, is found and seen to advantage, standing upright as a sentry on guard, in gorgeous uniform, perhaps in the shelter of a broom or gorse bush, or surrounding some huge granite boulder, sometimes gently swayed in the sweet breezes wafted over the heath, vocal with the hum of bees, and laden with the fragrance of the moorland flowers. It was in the shadow of a large rock not far from Dunsinane Hill where Macbeth's castle of historic fame stood, that I first made my acquaintance with the foxglove. Years afterward, I found the descendants of the same sentries keeping watch over the same rock, reminding one



DIGITALIS PURPUREA.

of the customs of times gone by, when certain posts of honor were hereditary in the family, handed down from father to son. It is not only on the heaths and moorlands that this most stately and beautiful of herbaceous plants is found, but in Scotland and some parts of England many a hillside, and dry, sandy bank, or moorland margin, is made gay with the large purple flowers of the *Digitalis*. It belongs, botanically, to the order *Scrophulariaceæ*. In Britain, its native country, it grows to the height of from two to four feet perfectly upright, bearing from 50 to 100 beautiful purple (rarely white) campanulate flowers marked inside with yellow eye-like spots.

The flowers are in shape like the fingers of a glove, hence the name, and hang on one side of the stem. It is found distributed very widely in Britain from Lands End to the Orkney Islands, and also in Western and Central Europe, where there are also found two other species: *D. lutea* and *D. grandiflora*.

The digitalis had from early times a great reputation as a medical plant, being applied externally to ulcers and scrofulous tumours, and taken internally for diseases of the heart and for dropsy. For these purposes the leaves are used, being gathered when the plant is in bloom. It thrives best in a gravelly or sandy soil. The common name is from the Anglo-Saxon foxes-clife or foxes' glove. It is known by a great variety of names in Britain. In the south of Scotland it is called "Bloody Fingers," further north "Deadman's Bells," and on the eastern borders "Ladies' Thimbles," "Wild Mercury," and "Scotch Mercury." In Wales the synonyms are "Elve's Gloves," "Foxes' Gloves," "Red Fingers," and "Dogs' Fingers."

The German name of Thimble suggests to the botanist Fuchs, in 1542, the Latin adjective digitalis as a designation for the plant, which it has retained ever since. The earliest known description of the plant is that by the botanist just named about the middle of the sixteenth century, though it is certain that it was known to herbalists at a much remoter period, for it is mentioned in two distinct MSS. written before the Norman Century.

However, I must remember that my purpose in writing this article was not so much to give the history of the foxglove as to call attention to its usefulness in the herbaceous border of our grounds, or as a foreground of a shrubbery or margin of a lawn. It will thrive in odd corners. Its own dignified bearing, when in flower, seems to be communicated to all around it. I have grown it for many years in great abundance and in great luxuriance, for it seems to like the sandy soil of my garden. It comes up everywhere. The illustration will give some idea of how they grow when self sown. This is from a photograph of part of a patch of fox-glove which came up where some odd seed stems had been thrown down. In a wild state, in their native land, we seldom find more than two or three flower stems to one plant, but as I grow them, I have sometimes as many as eighteen or twenty with from 100 to 125 flowers on each were cut from this plant. I find that a cedar or spruce hedge forms a fine background to show them to good advantage. They seem to like a partial shade, at least, so as to be spared the glare of the midday sun in this climate. They require no care and no protection in the winter with me. I can see the seedlings by the tens of thousands now in my garden coming up around the old plants. Through the agency of the bees I have every conceivable shade of color from the purest white to the crimson-purple. Seed sown late in the fall or very early in the spring will flower the following summer in June or July. The seed is very fine and evidently needs no covering but a little shade. The seed is produced in great quantities. I made a calculation about a year ago of how many seeds one plant of digitalis produced by counting the seeds in one capsule or seed vessel. I found it contained 250, a second one 310 seeds. Taking the average number of capsules on each flower stem of fifteen to be one hundred, there would be at least 375,000 seeds produced by one plant, a wonderful illustration of the generous provision made by nature for the propagation and continuance of her "Earthborn Blossoms."

All I need add to this already too lengthy and discursive article, is to say, that in moving the plants from one place to another, say from the seed patch, as much earth as possible should be retained about the roots.

LILACS AT THE CENTRAL EXPERIMENTAL FARM.

BY DR. WM. SAUNDERS, C. E. F., OTTAWA.

The lilacs or syringas are among the most valued of all shrubs for the garden. They are favorites everywhere and almost universally grown. Their hardiness commends them, for they thrive not only in Eastern Canada but many of them endure the colder winters of the North-

West plains without injury. They are easily grown and the beauty and fragrance of their flowers, so freely produced in the early spring, and the richness of their foliage throughout the season, are qualities which make the lilacs deservedly popular.

This useful group of ornamental shrubs contains about ten species, seven or eight of which, with many splendid varieties which have been produced from some of them, are now more or less generally available for the decoration of our gardens.

The common lilac, *Syringa vulgaris*, was introduced to cultivation in 1597 and has, hence, been an object of admiration among lovers of flowers for more than 300 years. It is a native of Persia and Hungary, and when planted in good soil grows to a height of 10 to 15 and sometimes 20 feet. Although it suckers freely, if the suckers are persistently cut away it may be trained to a handsome tree-like form.

Lilacs may be propagated from suckers, also by budding. They are sometimes grafted on the privet, but this stock is undesirable on account of its tenderness and lack of vigour. Of late years many of the best varieties have been grown from cuttings which, when placed under suitable conditions, are said to root without much difficulty. Lilacs on their own roots are much to be preferred since when grafted on the common stock the suckers thrown up from the roots are sometimes so numerous and vigorous as to crowd out or weaken the graft.



SYRINGA VULGARIS, CHAS. XTH.

Among the earliest recorded varieties of the common lilac is the single white form *S. vulgaris alba*, and a reddish known as *rubra major* or *Syringa de Marley*. The first of the double forms, which are now so numerous and popular, was brought out in 1870, and since then most of the very best sorts now so much admired have been produced.

More than fifty varieties of *Syringa vulgaris* are included in the collection at the Central Experimental Farm embracing all the newest and finest sorts. As yet only a few of these have bloomed, and every season reveals new attractions in this wonderfully interesting group. Among those which have bloomed are some superb varieties a few of which will be referred to. The illustrations given are all from specimens grown at the Central Farm.

S. v. Charles 10th. A specimen bush of this fine sort is shown above. This is one of the freest bloomers of all the varieties thus far tested; the flowers are of a rich reddish purple hue, are highly fragrant and are most freely produced in large trusses. A bush of this sort when in full bloom becomes a striking and most interesting

object. This variety has been thoroughly tested in the most exposed situations and is thoroughly hardy.

S. v. Emile Lemoine. In this form the flowers are of a reddish lilac, very full, and double, a handsome and valuable sort and a free bloomer; one of the best.

S. v. Frau Damman. This is a pure white single lilac of great beauty. The flowers are produced in large trusses which are loose and graceful. The bush is also a very free bloomer. A single cluster of bloom is shown on next page.

S. v. Alphonse Lavelle. A flower truss of this variety is shown on page 181. It is a very handsome form, the flowers are of a beautiful bluish violet color and are produced in abundance in very large panicles.

S. v. President Carnot. This is an excellent sort which produces fine trusses of large single reddish lilac flowers, clusters of this variety are shown in the illustration.

S. v. Madame Abel Chateau. This is perhaps the finest of all the flowers yet produced at Ottawa in this wonderful group of lilacs. The panicles are large and the individual flowers of unusual size, of a pure white, very double and of great substance. It is also a free bloomer.

Syringa Josikea, Josika's Lilac. This is a robust growing species, a native of Hungary, which was introduced into cultivation in 1588 and is now very widely distributed. Its leaves are large, glossy and of great substance, of a deep green color above and paler below. This shrub is well worth growing for its foliage alone. The flowers, which appear from ten days to a fortnight later than *Syringa vulgaris*, are of a bluish purple, the clusters are smaller than those of the common lilac, they also lack perfume. When well established, this variety blooms very freely and attains a height of from 6 to 10 feet. It makes a beautiful hedge, its rigid habit and glossy laurel-like leaves produce a fine effect. For this purpose young plants should be chosen and put out in a single row about 15 inches apart.

Syringa Persica, Persian Lilac. This species is a native of Persia and was introduced in 1640. It is a shrub smaller in size and less robust in habit than most of the other species, growing usually from four to six feet in height. The flowers, which are borne freely in good sized clusters, are bluish purple; another variety of the Persian lilac produces white flowers; both these forms are common in cultivation. This species is not quite so hardy as most of the other lilacs. A cut leaved from *S. P. laciniata* has also been produced.



S. VULGARIS PRESIDENT CARNOT.



S. VULGARIS FRAU DAMMAN.

considerably larger than those of the common lilac, with the underside more prominently veined, and the flowers, which are purplish or white, are arranged in longer and looser panicles. A form of Emodi with variegated leaves has been introduced, which is quite attractive. Both of these have been found less hardy than the common lilac at Ottawa.

Syringa villosa, is a native of the northern parts of China of quite recent introduction, having first been brought into notice in 1880. It is lower growing than many of the other sorts of lilac, varying in height from three to six feet. The leaves are of medium size, ovate in form and rather obtuse, the flowers are of an attractive shade of pale bluish-rose, less fragrant than those of the common lilac. This shrub is a free bloomer, but the flower clusters are not so large as in some of the other varieties. Its time of blooming is about two weeks later than the common lilac, it has been tested for four or five years at Ottawa and found to be perfectly hardy.

Syringa oblata. This handsome variety has not yet found its way into very general cultivation. It is a native of China and was introduced in 1859. The leaves are large and wide, oblate or heart-shaped, and rather thick and fleshy. The flowers are purple, larger than those of the common lilac, and produced in large and handsome clusters, which are very attractive.

Syringa Chinensis known also under the name of *S. Rothamgensis* or Rouen lilac. This is a very desirable shrub, well known and much appreciated. It was introduced into cultivation in 1795, and is said to be a hybrid between *S. vulgaris* and *S. persica* which was raised at Rouen by Mr. Varin then director of the botanic garden there. This variety is loose and graceful in habit, the foliage is intermediate in size and form between the common lilac and the Persian, the flowers which are of an intense purplish violet color are borne in large clusters produced in abundance.

A form of *S. Chinensis* is also in cultivation known as *S. C. Saugeana*, the flowers of which are of a reddish purple color.

Syringa Emodi—From Mount Emodus in the Himalaya mountains. This species was introduced to cultivation in 1840, and is quite distinct in its character. It grows to a height of about six feet, and is somewhat rigid in form. The leaves are

In its habit of growth this species much resembles the common lilac. There is a form of *oblata* which produces white flowers. The purple variety has been tested for several years at the Central Farm at Ottawa, and has been found quite hardy.

Syringa Amurensis is a native of Manchuria, China and Japan, and is common in the valley of the Amour. It was introduced in 1863. The shrub has a somewhat spreading habit

and a graceful form, and grows to a height of from six to eight feet. The flowers are small, creamy-white, and produced in panicles of varied form, some being short and compact, others long and sparsely flowered. It usually blooms during the third week in June. This is a hardy and desirable species.

Syringa Japonica. This is a native of Japan and was introduced to cultivation in 1885. It is the latest in blooming of all the lilacs and does not usually flower in Ottawa until the first week in July. The flowers are small, creamy-white, and are produced in large dense clusters. They have a fragrance quite distinct from the ordinary lilac, reminding one of the hawthorne or the privet. The leaves are large and of a dark green color. This species grows taller than *Syringa vulgaris* and forms an attractive tree-like specimen.



S. VULGARIS ALPHONSE LAVALLÉ.

With a judicious selection of the species, and varieties referred to, one may have a succession of lilacs in bloom for from four to five weeks.

PAEONIES AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA, ONT.

BY DR. WM. SAUNDERS, DIRECTOR.

The paeony which is said to derive its name from Pæon, a Greek physician, who first employed the plant medicinally, may be conveniently divided into two groups, the herbaceous paeony and the tree paeony. The herbaceous paeonies have tuberous roots something like those of the dahlia which send up stout flower stems every year, which at the close of the season die down. The new growth the following spring is made from strong buds or crowns which form on the tubers. These herbaceous species have been derived mainly from two wild forms, one a native of Switzerland, *Paeonia officinalis*, which is said to have been in cultivation for more than three centuries, the other a Siberian species, *Paeonia albiflora*, which was first introduced in 1734. The shrubby forms of the paeony known also as the tree paeony have been derived from an Asiatic species known to botanists as *Paeonia moutan*. The tree paeony is much grown in Japan, China, and in the milder climates in Europe. In Eastern Canada it is more or less tender and unless well protected is liable to be killed to the ground during the

winter, and even where protection is afforded during the severe weather, the tender shoots sometimes suffer injury from spring frosts. Where the tree paeony can be successfully grown it is a very desirable shrub ; it blooms earlier than the herbaceous species and the individual flowers are wonderfully large and fine. About 20 varieties of the tree paeony have been tested at the Central Experimental Farm, but none of them have been found entirely hardy.



BED OF PAEONIES AT C. E. F., OTTAWA.

When the snow comes early and covers the ground well during the winter they pass through this trying period without much injury, but in seasons where the snow covering is insufficient they are usually killed back nearly to the ground and not unfrequently killed outright.

The herbaceous paeony, with which in this communication we are chiefly concerned is one of the hardiest and best known of all perennials, and owing largely to the recent introduction of many new and beautiful varieties its popularity is steadily increasing. It is hardy not only in the eastern provinces of Canada but also in the north-west portions where the winter climate is much more severe. At the branch experimental farms, at Brandon, in Manitoba, and at Indian Head, in Eastern Assiniboia, a number of varieties have been tested during the past five or six years and most of them have proven quite hardy and have borne flowers very freely for the past two years. The paeony succeeds well under almost every condition, and will thrive even in the gardens of the negligent and careless, but when well cared for, it responds to good treatment by producing a wealth of magnificent flowers of a most attractive character.

The tubers as supplied by the dealers, especially of the newer sorts, are comparatively small, and do not usually flower the first year, but they grow rapidly and if left undisturbed for three or four years they form extensive clumps which produce flowers in great number and of large size. The plant is propagated by division of the roots, but where fine flowers are desired the parent plants should be disturbed as little as possible. The flowers are very varied in color, assuming every hue and shade from the deepest crimson through all tints of red and pink to pure white.

Of the herbaceous paeonies, there are now in the collection at Ottawa 141 named varieties, consisting mainly of those sorts which have been produced within the past thirty or forty years by florists in Europe. Most of these were planted in 1895, with a more recent addition of about thirty varieties from Japan. They are arranged in three large beds, each containing three rows of plants put out three feet apart each way, and are planted so as to have the plants in the second row alternate, and those in the third row opposite those in the first row. A part of one of these beds is shown in bloom on page 182. The mass of flowers produced under these circumstances, when the plants are well established, is very effective, and the beds are much admired when at their best in the latter part of June and early in July.

With so many beautiful varieties to choose from, selection becomes somewhat difficult. I shall, however, venture to name a few which appear to be among the most desirable of these which have yet been tested at the Experimental Farm.

In the group we have a single flower of a variety known as *Madame d'Hour*. This was planted in 1895, bloomed well in 1897, and magnificently in 1898 and is certainly one of the best in the collection. The flowers are very large and double, the petals nearly white with a delicate rosy tint becoming deeper in color towards the base. The specimen measured seven inches across and the blooms were produced in great profusion.

Berlitz, is another good sort. The flowers are large to very large, very double, of a deep rose color with paler shadings on the margins of the petals. This also was planted in 1895, made strong growth, bloomed freely in 1897, and very freely in 1898.

Ambrose verschaffelt is a charming flower of medium size, a deep crimson-color, and is very full and double and well formed, it also bloomed well.



BERLITZ.



"DECAISNE."

The Japanese varieties were planted in 1897 and 1898, and all those which have bloomed have shown much grace and delicacy of form with striking combinations of color. Most of them have only one or two rows of outside petals which are wide and the centre is filled with a cluster or rosette of very narrow petals, delicate in form and hue, usually tinted with shades of yellow margined with pink. The Japanese appear to prefer these chaste and loose semi-double forms to the larger, stiffer and more fully double sorts; some of their flowers are of great beauty of form with wonderful delicacy in their tints.

Some-ganoko is a good representative variety of this class. The flower is of medium size, the outer petals of a deep blush rose with paler markings, the centre being filled with a lovely rosette of very narrow yellow petals neatly arranged, each with a thread-like base and tinted above with pink.

Kame-no-Kegoromo is a large, handsome, loosely double flower of a deep carmine-red color with a number of narrow petals distributed about the base of the wider petals, the former being crimped and twisted, yellow in color, margined with red.

Tatsu-gashira is also a very beautiful flower. In this variety there is a single row of wide petals nearly white, with the centre partly filled with a loose cluster of very narrow yellow petals tinted with rose.

Decaisne. This is a strong grower and free bloomer. The flowers are large, full and double, of a blush-pink color, paler in the centre. In addition to its other attractions this variety exhales a pleasant rosy odor.

Purpurea superba produces flowers which deserve to rank with the best. This variety is a strong grower and very free bloomer. The flowers are of a very deep rose-color finely formed and very attractive.

Papaveriflora is an elegant flower of good form and very double. Its color is white with a faint yellowish tint. The outer petals are wide, while those forming the inner part of the flower are much narrower, making a very handsome combination.

Solfaterre is not very double, but is very loose and graceful in form, the outer petals are wide and of a pale rose-color, while the centre is made up of much narrower petals which are almost pure white. This is a very free bloomer and is one of the sweet-scented sort.



"PAPAVERIFLORA."

Paeonia tenuifolia, which is shown in the front of the bed seen in frontispiece, is very striking on account of its finely cut foliage. It is a distinct species from the other sorts referred to of which there are two varieties in common cultivation, one of which is single, the other double, and both of a deep crimson-red color. This is a native of Siberia, is very hardy and is the earliest variety to bloom.

CARNIVOROUS PLANTS OF CANADA.

BY D. W. BEADLE, TORONTO.

Although to the horticulturist as a commercial grower, flesh-consuming plants may not be of special interest, yet, as a student of plant life, a brief account of how some plants obtain nitrogen may be to him both interesting and valuable.

Those that will be mentioned fall naturally into two groups, the one composed of those that capture by means of closed chambers, or open pitfalls, so contrived that animals entering may not be able to get out. In some instances the pitfalls are made attractive by a display of brilliant color, and the downward way alluring by a spread of sweets. It is in a more enticing way the old story :

“Walk into my parlor,” said the spider to the fly,
“I’ve the prettiest little parlor ever you did spy.”

The other groups consist of those that perform certain movements specially designed to secure their prey.

There is a third group, to it belong plants, the leaves of which are provided with glands that secrete a sticky substance to capture insects and fluids to digest them. Some Canadian plants have sticky foliage, but the writer is not aware that it has been ascertained that any of them can digest the insects that may chance to adhere to the leaves.

The first group is represented in Canada by five species of bladderworts, which illustrate the closed chamber contrivance, and one species of pitcher plant which uses the pit-fall method. Of the bladderworts, four species live in ponds or pools, in bogs, one roots in mud. The aquatic species have no roots, they float just below the surface of the water, throwing up only flower stalks with their yellow flowers into the air. See figure 1, copied, as are all illustrations in this paper, from the “Natural History of Plants,” by Anton Kerner, Professor of Botany in the University of Vienna.

The life history of these plants is as follows:—In the autumn spherical buds are formed at the ends of the branches, the leaves and old parts die, become saturated with water, sink to the bottom, taking of necessity these buds with them, where they remain all winter. On the return of growing weather these buds increase in size, become separated from the old decaying

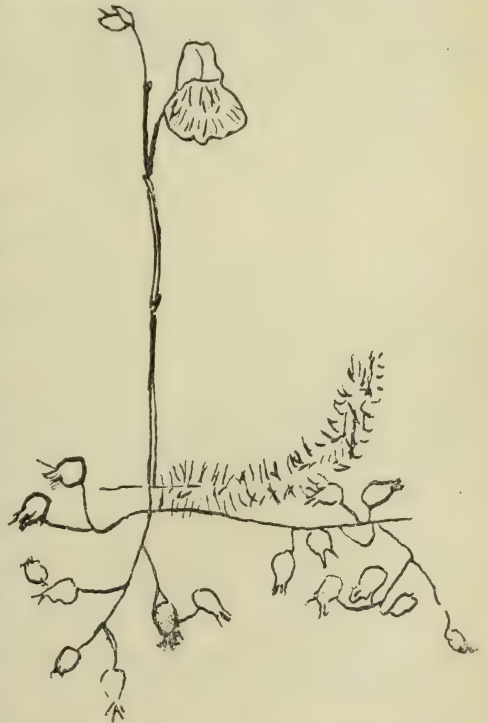


FIG. 1.

branches, ascend to near the surface and soon develop into a plant similar to that shown in Figure 1, with leaves and bladders. In some of the species all the branches are supplied with leaves, the bladders being distributed among them; other species have the foliage and bladders on separate branches.

The bladders are constructed in such a manner that each is a trap especially designed to catch small animals. Their form and general appearance is shown in Figure 2, considerably magnified. The opening into the bladder is at the base of the stiff tapering bristles, which are so placed around it as effectually to prevent any other than animals small enough to enter the orifice from even approaching. The entrance is formed with four rounded angles, nearly square in outline. The underside or threshold is strongly thickened, from which a solid cushion projects inward. To the upper side, or lintel, is fastened a thin transparent valve, which closes upon the cushion completely shutting the aperture. The valve is so elastic that it can be easily pushed up by the tiniest animal on the outside and so get within; as soon as it has entered, the valve instantly springs back to its normal position, and the venturesome prisoner is a captive for life. Over the entrance might truly be written—

“Who enters here leaves hope behind.”

Sooner or later the captives die and decay. Lining the interior surface of this prison house are cells especially designed to absorb the products of this decay, which thus become a source of nitrogen to the plant. We learn from Kerner that the number of animals thus captured is comparatively large, that most of them are small crustaceans, supplemented by larvæ of gnats and other small insects. That they must needs be small is evident from the fact that the bladders themselves do not exceed five millimeters in diameter, about one-fifth down to one-twelfth of an inch. What is it that induces these tiny members of the animal kingdom to press open the door, as it were, and force an entrance into this death trap, is as yet an unsolved riddle. Mr. Kerner suggests that it may be to escape being drowned by larger predaceous inhabitants of the pool. Certainly none ever come back to warn their fellows.

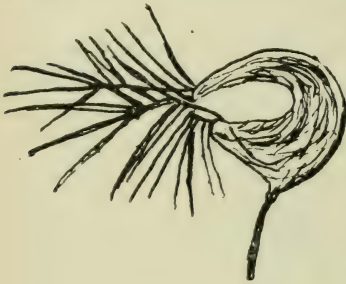


FIG. 2.

We give, for those who may desire to examine these curious plants, a brief account of the few species indigenous in Canada: Flowers yellow, one petaled, two lipped.

Utricularia vulgaris, the greatest bladder wort; bears numerous bladders interspersed among the leaves, from three to twenty flowers, found from the Atlantic to the Pacific.

U. intermedia. Flat leaved bladderwort; the bladders with rare exceptions are borne on leafless branches; flowers one to five, reported from Newfoundland, New Zealand, Quebec, in Ontario, from Ottawa west to London and northward at Lake Huron, Lake Superior and Lake Nipigon, also in Manitoba and the Rocky Mountains.

U. gibba. Humped bladderwort; few very small bladders scattered among the leaves and only one or two flowers; found at the eastern part of Lake Partridge, Addington County, Ontario (Macoun) and near Westminster, London, Ont. (Dearness).

U. clandestina. Hidden fruited bladderwort. This species, like our wild violets, has two kinds of flowers; one kind, like those of the other species, in number three to five; the others very numerous, and borne among the bladders under water, strictly cleistogamous, that is, fertilized in the bud, reported from Kent and Albert Counties, N.B.

U. minor. Lesser bladderwort. The bladders of this species are very small, about one-twelfth of an inch in diameter and not numerous, sometimes not any; the flowers from one to

ten, flower stalk from two to six inches high. In a marsh at Mount Stewart, Prince Edward Island (Macoun), Labrador to British Columbia (Britton).

U. Cornuta. Horned bladderwort; grows in the mud at the margin of small lakes and ponds, flowers one to six; very abundant along Gulf River, between Big and Little Bushkong Lakes; Lake Nipigon (Macoun); reported from Newfoundland, Nova Scotia, New Brunswick and Quebec. The writer has seen it in bloom on the borders of small lakes near Gravenhurst in the month of July, but could not find any bearing bladders.

PITCHER PLANTS. The pitfall contrivance is formed by the metamorphosis on the leaves of the pitcher plants into sacs. There is one member of this family common in Canada, from the Maritime Provinces to the Rocky Mountains, growing in mossy bogs and marshes. *Sarracenia purpurea*, Pitcher Plant, Huntsman's Cup. See Fig. 3, showing the rosette of leaves and flowers borne single upon the upright stalk.

As will be seen by the engraving, the leaves, arranged in the form of a rosette upon the ground, instead of the usual flat leaf blade, and narrow leaf stock, has been changed, stalk and blade into lengthy sacs, resting upon their backs inflated about the middle, somewhat contracted about the mouth, which is raised up from the ground and bordered with a collar or sort of hood. This hood is streaked with red veins, often of a vermillion brightness, and holds its concave surface in a position to catch the rain drops and conduct them into the cavity below. Near the mouth the pitcher is provided on the inside with glands, which



FIG. 3.

exude a sweet fluid that is spread thinly over what may be termed the throat. Below this the interior is lined with long, thin, sharp-pointed bristles. See Fig. 4, a section through the wall of the sac, showing the long, spinous bristles greatly magnified. The bright colors and sweets allure the insects, many glide down over the smooth slippery spines; after vainly endeavoring to climb the bristle-lined wall they sink exhausted into the water below and perish. When a number are decaying the water becomes turbid, resembling manure water. It is not yet known whether the fluid is mere rain water or whether the gland-like cells at the bottom exude a secretion which modifies its character. It is in this way that the Pitcher Plants obtain more or less of their required nitrogen. These comprise all of the Canadian plants embraced in the first group.

Turning now to the consideration of the second group, those plants that exhibit movements in capturing their prey, we find that the Canadian members are confined to two plant families, one also belonging to the Bladderwort family and four to the Sundew family. This one, which is placed by botanists in Bladderwort family, has no bladders, does not live in water, captures insects by the involution of its leaf margins. It may be briefly described as follows:—*Pinguicula vulgaris*, Butterwort. The leaves are entire, arranged in a rosette at the base of the leafless flower stalk, flower violet-purple, one-petaled, two-lipped, upper lip two cleft, under three

cleft, nearly straight nectar-bearing spur varying from one-sixth to one-third of an inch in length. Its range is from Newfoundland and Quebec through Ontario to the Rocky Mountains. In Ontario at Red Bay, Lake Huron, along the coast of Lake Superior from Michipicotin to Red Rock, on St. Ignace Island and on the east coast of Lake Nipigon (Macoun).

Figure 5 represents a flourishing plant. The upper surface of the leaves is covered with the numerous glands which secrete a sticky fluid that is poured out profusely whenever an insect or other nitrogenous body is brought continuously in contact with them ; to this, at such times only, is added another fluid similar to the gastric juice of animals. When small insects alight upon the leaf they are detained by the sticky substance already presented ; struggling to extricate themselves only makes matters worse by exciting the glands to a more abundant discharge. If they alight near the edge where the glands are less numerous, this part of the



FIG. 4.



FIG. 5.

leaf gradually rolls inward to cover its prey. If the creature be too large to admit of that, it is pushed into the middle where the glands are abundant. The only movement is that made by the leaf margin, it is not rapid, it is slow ; if it folds over the insect it will remain in that position until its prey has been digested and absorbed, which is usually completed in twenty-four hours, when it will forthwith move back to its normal position.

There is something almost startling when told that a member of the vegetable kingdom is endowed with sensation, a seemingly voluntarily power of motion, and digestion through the secretion of a digestive fluid like that of animals.

What becomes of the vanishing line between the animal and the vegetable kingdom ? Doubtless our *Pinguicula vulgaris* received its name of Butterwort from being greasy to the touch, but far more than a century ago its leaves were used in dairy farming to produce the same changes in milk that are now brought about by the use of rennet, so that its association with dairy products is more than fanciful.

The movements made by the members of the Sundew family are more striking, especially those of the leaves of Venus Flytrap, *Dionaea muscipula*, which are not found north of North Carolina. Nevertheless, the process of capturing small animals by those members growing in Canada are very interesting.

Upon the upper surface of the leaves of these plants are numerous delicate wine-red filaments, tipped with a tiny round knob, bearing a fluid droplet. These filaments are of unequal length, resembling a number of small pins thrust into a cushion to unequal depths, the shorter in the centre, the longer at the margin. Each leaf is said to contain about two hundred. The ball-shaped knob is a gland that secretes the tiny droplet which is transparent and sticky, sufficiently cohesive to be easily drawn out into threads. This droplet, glittering brightly in the sunlight much resembles a dewdrop, hence the name Sundew. When an insect or other organic nitrogenous body touches any of these glands they at once begin to discharge a true digesting fluid such as is secreted by the leaf glands of the Butterwort, and having the same properties as the gastric juice of the animal stomach.

Doubtless, many insects are deceived by the glittering droplets, mistaking them for honey, become entangled among them by reason of their adhesiveness, and in endeavoring to escape cause the glands to give out a more copious effusion and set the filaments in motion. The filaments to which the insects adhere begin to bend inward, much as we bend a finger into the palm of the hand. When this has bent down so that the prey is brought to the surface of the leaf, the filaments nearest to it will bend in the same manner, and when these touch the surface others adjoining follow, and this sort of movement by detachments is kept up until all the filaments are bent down.



Fig. 6.

over the captive. This is magnified, and illustrates the movement when the insect has been captured by one of the filaments on the margin of the leaf of the round-leaved series, by which it is necessarily brought into the centre. It must often occur that the capture is made by a filament other than one on the margin, but, whatever the position, the incurving filaments never fail in their aim. If two are captured at the same time the filaments divide into two groups. Indeed, all these movements vary according to the needs of the movement, so that the purpose to immerse the prey in an abundance of digesting fluid never fails of accomplishment. The filaments are also endowed with discrimination, for if grains of sand, or other non-nitrogenous bodies come in contact with the glands, though secretion is increased, no pepsin is discharged and no bending takes place. As soon as the prey has been digested the filaments resume their former position, the time occupied in absorbing the nutrient portions varying with the size of the captive. It is surprising to find that they capture so many and so large

Figure 7 shows a leaf with half of the filaments bent

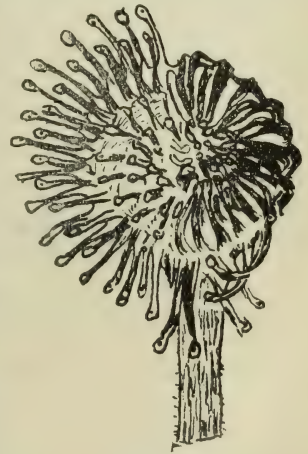


Fig. 7.

insects, not midges only, but ants, flies, small butterflies, dragon flies, these larger being secured by the co-operation of two or three leaves. The remains of thirteen different insects have been found upon a single leaf.

A brief mention of the several Canadian species of Sundew will close this paper.

Drosera rotundifolia. Round-leaved Sundew, grows in bogs and marshes from the Atlantic to the Pacific. See figure 6, natural size. *D. intermedia*, Spatulate Sundew, in bogs and margins of lakes throughout Quebec and northern Ontario to Manitoba. Both of these are abundant in mossy beds bordering Holland River west of Newmarket.

D. longifolia, Oblong-leaved Sundew, in boggy ground along the shores of Lake Huron, Bruce Peninsula, Manitoba and British Columbia (Macoun).

D. linearis, Slender-leaved Sundew, in marshes of Lake Simcoe, Chicken Bay, McLeod's Harbor and Cockburn Island. Lake Huron to Manitoba and Rocky Mountains.

SHADE TREES.

BY PROF. W. LOCHHEAD, O. A. C., GUELPH.

Many inquiries were made this year regarding the treatment of shade trees which were showing signs of lack of vitality. In some cases the cause of the unhealthy condition of the trees was plainly due to insects, in other cases to fungi, but most frequently the cause was due to purely physiological conditions, such as unfavorable conditions of the soil, or atmosphere.

The towns and cities of Ontario can point with pride to their beautiful avenues of trees which not only furnish a grateful shade from the sun's rays during the hot days of summer, and cause refreshing breezes to blow along the pavements, but also give shelter from the winds and storms of winter. The larger the town or city the more attractive these trees become by way of contrast with the long walks of naked brick and stone.

The value of shade trees lies not only in the shelter and shade they furnish, but they also conduce to healthiness, and their value in this connection can scarcely be estimated.

PART I.—CARE OF TREES.

That many of these valuable trees are dying, or are in an unhealthy condition due to physiological conditions, is a fact that requires attention on the part of their owners, and it is the purpose of this article to point out the remedies that may be applied to invigorate these trees, and the causes which bring about these undesirable conditions.

(1). Trees, like animals, require food, and if the supply runs out they must inevitably starve. One of the chief causes for the unhealthy, dying condition of so many trees is this lack of food supply.

It is true that a tree makes use of the almost inexhaustible reservoir of carbonic acid gas in the atmosphere, and the water in the soil, but it should not be forgotten that a tree requires inorganic food which is absorbed by the roots. A farmer does not expect a crop from soil which contains no nourishment, but somehow or other many persons entertain the very erroneous idea that a tree ought to grow and thrive for years upon the food which happens to be in the soil in the immediate neighborhood of the roots.

Very frequently when a tree is planted, the earth which has been thrown out in making the hole is thrown back again and packed about the roots. The amount of food in such a case will not suffice for any length of time. Sometimes the tree will live and thrive for several years; then it is because the soil has been richer than usual. Every year the ground

for a yard or more should be padded deeply, and a dressing of well-rooted manure or compost applied. In doing so a constant supply of food will be maintained, and the tree will grow and thrive.

(2). A second cause for the disease of vitality in many shade trees is the lack of perfect circulation of air in the soil. The vital processes in the roots demand a supply of oxygen, and if this gas is excluded the roots die of asphyxia, or root rot. Oxygen is required, not only for growth, but also for the formation of reserve materials. A good florist knows how to provide for drainage in potted plants; he knows that a hard clay bottom is unsuitable. Too much water and soil of too close a texture will prevent the circulation among the roots and root-hairs, and a free interchange of the atmospheric and soil gases. The best foresters advocate drainage for every tree. Too often the water which is given the tree, lodges in the hole made for the tree, so that the soil becomes saturated and aeration is prevented.

When trees are planted along the sides of cement pavements and paved streets, as is the case in many of our towns and cities, they suffer from an imperfect supply of air among the roots.



FIG. 1. Maple Tree affected with Stag Head. Suffering from lack of proper drainage.



FIG. 2. Maple Tree suffering from Stag Head. (Due to lack of proper nourishment.)

The hard impervious pavement prevents, not only a proper supply of oxygen, but also proper evaporation from the soil beneath.

A common form of disease arising from the diminution of the supplies of food and water, is Stag Head—"when the top branches become leafless, dry off and remain as dry sticks, like antlers projecting from the foliage." The lower branches remain green, but make but little growth.

In the treatment of Stag Head, the sod should be removed from a space two or three feet in radius about the tree. This circular area should be frequently stirred by the spade and kept raked, as this process will tend to promote aeration; but unless provision has been made for proper drainage when the tree is planted, aeration will be perceptibly checked whenever a prolonged wet period occurs. The young rootlets decay, the tree is weakened, and becomes more liable to attacks of fungi, which prey upon the roots.

(3). Another cause for the death of many trees in Sun Scald, which produces a wilting of the tissues by a too rapid evaporation from the leaves. The tender young shoots are very liable to injury from such a source, especially if they are subjected to a hot sun after a period of rapid growth in moist weather. The edges of the leaves turn reddish yellow, wilt and dry up.

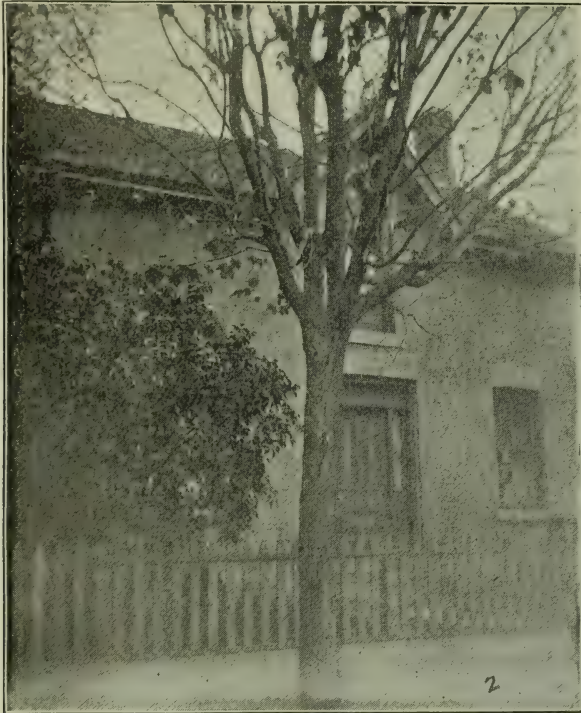


FIG. 3. Work of Borers on Maple Shade Trees.

(4). A cause which produces practically the same results as Sun Scald is known as Winter Blight. The tissues wilt, owing to too rapid evaporation during fine, warm days in winter, when the soil about the roots is frozen, or when dry cold winds prevail.

It is very difficult to provide remedial treatment for Sun Scald and Winter Blight. Perhaps a liberal mulching with manure or straw would be as efficacious a remedy as any that could be devised.

(5). Other causes occasionally produce serious results but only under peculiar circumstances. Sometimes the air of cities and towns becomes poisoned with harmful gases to such an extent that whole avenues of trees are seriously affected. There is of course no remedy available in such a case.

A few words may be said as to the treatment of old trees which are showing signs of lack of vitality. Growth may often be stimulated by assisting nature when the roots have become sluggish. The branches should be pruned so that the demand upon the roots may not be exceeded by the transpiration from the leaves. The turf, moreover, should be removed and the soil given a top dressing of compact earth before replacing the sods, so as to allow the nutrient salts to be washed down to the rootlets by the rain.

All decaying patches or holes should be mended by clearing off all rotten wood, and the place finally closed up with pitch or coal tar to prevent the entrance of fungi.

PART II.—INSECT ENEMIES.

The insects which attack trees may be divided into three groups, viz., Borers, Leaf-eaters, and Sap-suckers. The Borers are chiefly the grubs of beetles; the Leaf-eaters are chiefly lamellicorn beetles, and the caterpillars of certain moths, and the Sap-suckers are hemipterous, or half-winged insects. A knowledge of the life history of these injurious forms is of great service in the fight against them, and can readily be obtained by a reading of the standard works on insects.



FIG. 4. Work of Borers on Maple Shade Trees.

1. The chief borers are the Round-Headed and the Flat-Headed Borers. The Round-Headed Borer (*Saperda candida*) is, perhaps, well known to many of the readers of this magazine; but for the benefit of those who are not yet acquainted with the pest, I shall give a few facts about its life history and general appearance.

The beetle is about an inch in length, and has a broad, white stripe running lengthwise along each wing cover. The general color of its upper surface is light brown. Its feelers are quite long and jointed. The grub is over an inch in length when full grown and has a peculiarly shaped head, which is quite characteristic, being rounded, and much greater in diameter than the body. The pupal condition is seldom seen because it does not remain a pupa for any length of time.

Near the end of June the beetle lays her eggs close to the ground on the trunk of the tree, under some loose bark. The young grub or larva eats its way through the bark into the sap-wood, where it remains usually a year, then it bores up into the hardwood whence it emerges as a beetle after a sojourn of nearly three years. The last month prior to emergence from the tree is spent as a pupa at the upper end of the burrow. The tunnel in the sap-wood is flat, and is usually nearly filled with saw-dust castings.

The beetle emerges about the middle of June, and proceeds with all dispatch to prepare for the laying of the eggs. Figures 3 and 4 show very clearly the characteristic markings these beetles make upon trees. The owner of the trees tried to cut out the grubs, but this method produced the big, ugly scars which made the trees unsightly. The adoption of this method of treatment supposes that an ugly shade tree is preferable to a dead or dying one. The best remedy is a combination of preventive and destructive measures. In the fall the trees should be carefully examined and wherever there are indications of saw-dust, the tunnels should be probed with a stout wire so as to kill the grub. Again in June, the trunks of the trees should be treated with a mixture, which will prevent the deposition of the eggs. A carbolic soap mixture, made by adding a pint of crude carbolic acid to a quart of soft soap dissolved in two gallons of boiling water, applied with an old scrubbing brush, has been found very effective. A whitewash applied on the trunk and well up into the branches is also to be recommended.

The Flat-Headed Borer (*Chrysobothris femorata*) is almost as destructive as the Round-Headed Borer, and has a very similar life history. In appearance, however, it is quite different, the beetle is about half an inch long, flattened and of a dark green bronzy color. (Fig. 5). The grub, or larva is light green in color, about an inch in length, and with a very conspicuous head which is flat, and very broad compared with the body. Usually, it does not take so long for this insect to pass through the various stages of its life history as is the case with the Round-Headed Borer. The period varies from one to three years, generally one year. As in the case of the Round-Headed, the beetle deposits her eggs about the end of June. The young grubs bore into the sap wood where they tunnel out flat channels, sometimes girdling the tree. These tunnels are not so regular, and do not penetrate so far into the hardwood as do the tunnels of the Round-Headed Borer.

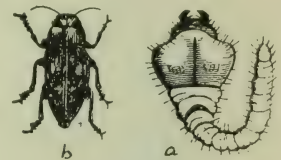


FIG. 5.

As a rule the eggs are deposited on the trunk a few feet from the ground.

The same remedies may be used against these pests as have been found effective with the Round-Headed Borer. Prof. Comstock advises the placing of one or two cakes of soap in the forks of the trees, so that the rains will dissolve the soap and wash it down over the trunks.

It may be said here that these two borers are not only destructive to shade trees, but to apple, quince and pear trees.

There are other borers which also do much harm. The Locust Borer (*Cyrtene robiniae*) is destructive to locusts in some localities. The beetles of these may be collected quite readily on Golden Rod in the fall. They are black with many yellow bands crossing the wing covers.

Many locust trees can be found whose trunks are perforated by holes made by the grubs of these beetles. The holes extend through the bark into the hardwood, injuring the trees so badly that death soon follows.

The grubs complete their full growth in one year. Much can be done in the winter to rid the trees of these and like borers by cutting off all dead and dying branches, and burning them before the insects have a chance to escape.

Maple trees are often troubled with borers (*Plagionotus speciosus*) which are closely allied to the Locust Borer. This beetle is a very pretty creature, being marked with yellow and black stripes. The eggs are laid in summer, and the grubs bore into the wood where they may be destroyed by a stout wire in the spring.

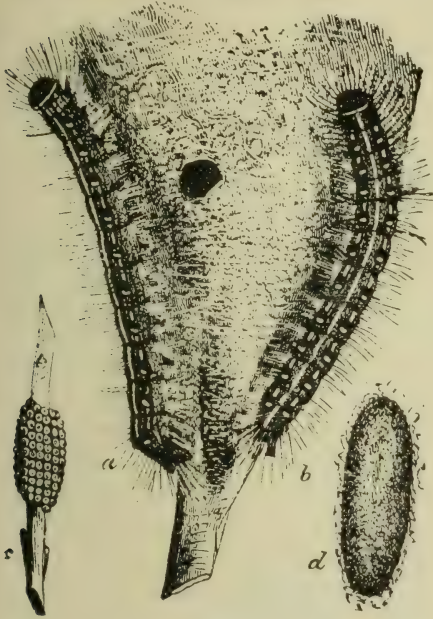


FIG. 6.

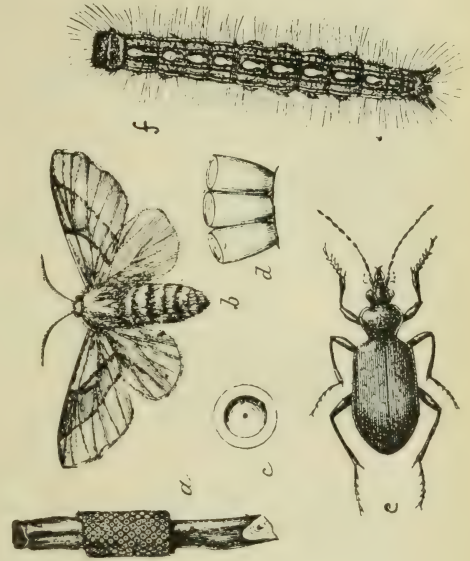


FIG. 7.

2. The chief Leaf-Eaters which infest shade trees are the Tent and Tentless caterpillars the Tussock caterpillar, the Fall Webworms, and the Bag-worms, all of which are larvæ of moths

The American Tent and Forest Tentless Caterpillars (*Clisiocampa Americana* and *disstria*) are doubtless familiar to most readers. The accompanying figures (Figures 6 and 7) show the characteristic features of the eggmasses, larvæ, tent and moths. Much may be done to lessen the ravages of the Tent caterpillars by the destruction of the egg masses in the fall, winter and spring and by burning the tents as soon as they appear in the spring, but there seems no practicable method of dealing with the Tentless caterpillar, which soon comes from the woods to the orchards and lawns. These make their homes primarily in the forests, where it is impossible to clear off the egg masses.



FIG. 8.

All shade trees should be sprayed, as soon as leaves are opened, with arsenate of lead solution, made by dissolving in a wooden pail three ounces of acetate of lead in one quart of water, and in another wooden pail dissolve one ounce of arsenate of soda in one pint of water ; empty the

contents of each of the pails into a barrel of water (40 gallons). Stir well and add one quart of glucose. Tar bands, moreover, should be placed around the trunks, and pyrethrum powder may be used to advantage about the tree.

The Tussock caterpillar (*Orgyia leucostigma*) is very destructive some years, but with care the trees may be kept free from its ravages.

The white, froth-like masses of eggs, which remain over winter on the trunks and larger branches, and even on buildings and fences near by, may be scraped off and destroyed during the winter. If a few survive this treatment to show themselves as larvæ, spraying with Paris Green will kill most of them. The bands of tar brushed on the trunks three or four feet from the ground will prevent the wingless female from ascending the trees to lay her eggs.



FIG. 9.

The Fall Web-worm (*Hyphantria Cunea*) is another serious pest of shade trees. (Fig. 9.) The moth is either pure white or white spotted with black and is a very pretty creature. It lays a cluster of 300 or 400 eggs on the leaves. The caterpillars leave the web and crawl down the trunk to the ground to spin their cocoons, within which they pass the winter as pupae. Several methods may be adopted to rid the trees of the pest. The collection of the cocoons, and the spraying with Paris Green are both effective; but, perhaps, the most effective mode of treatment is to

burn the webs and the contained caterpillars. A long pole, to the end of which a swab saturated with coal oil is fastened, makes a good torch for burning the webs.

The Bag-worm (*Thyridopteryx ephemerae-formis*) although rare with us on shade trees, is a pest in some cities to the south of us. During the winter silken bags, to which bits of leaves and sticks are attached, may frequently be found on the twigs of conifers and other trees. These bags contain eggs which hatch in the spring, the little caterpillars emerging from the bags and feeding upon the leaves. They become mature or full grown in late summer, when the bags, which they have constructed and carried about with them, are fastened securely to branches or sometimes to fences near by. Within the bags the caterpillars change to pupae. The male moths soon emerge but the female moths, being wingless and passive, never leave the bags, where they lay large masses of eggs.

The surest remedy for the bag worm is to pick the bags during the winter and destroy them. If the bags are destroyed no caterpillars can make their appearance unless they come from some outside source.

3. The chief Sap-suckers are the Woolly Maple Bark Louse, or the Cottony Maple Scale, the Spruce Gall Louse and several kinds of armoured Scale-insects. These all have mouth-parts adapted for sucking the juices of the plants they infest.

The Cottony Maple Scale (*Pulvinaria innumerabilis*) is very frequently injurious to maples (Fig. 10). These scales attract attention in the spring by the large cottony masses which envelop them. Within the cottony masses are the eggs, from which in a short time the young lice hatch and spread over the branches and twigs. They soon settle on suitable spots, and begin feeding by sucking the sap. Full growth is reached about the beginning of September when the winged males appear. The females, however, remain under the scale all winter, and in the early spring the eggs are deposited in the fluffy, cottony masses. The application of water by hose connected with the city or town waterworks has been found effective in dislodging the eggs, and in brushing off the lice while moving about.

The Spruce Gall Louse (*Chermes abietis*) is, undoubtedly, a serious pest of the white, and other varieties of Spruce. During the last few years, it has done much damage throughout

the Province. In the early spring about the first week of May, woolly, fluffy masses may be seen on the terminal twigs of the spruce, and if these be examined large numbers of eggs may be found. In another week the lice hatch, and settle at the bases of the young shoots, which soon show the characteristic curl. (Fig. 11). The base of every infested leaf becomes enlarged and gall-like. The larvae are safe from insecticides as they now live within the base of the leaf. About August 10th, the winged female adults appear, and prepare to lay eggs for a second brood. Lice soon hatch, and spread over the limbs, but those that survive the first winter seek shelter at the base of buds. The second brood of adults appear at the beginning of May, when the fluffy, woolly egg masses are seen.

If the trees are sprayed thoroughly with a mixture of soap solution and tobacco solution soon after the eggs are observed most of the young will be killed. The operation should be repeated in August, when the second brood of lice make their appearance.

Although several armored scales were observed on shade trees during the past season, and perhaps some damage done to the trees, yet no general complaint has been made against their work.



FIG. 10.



FIG. 11.

FUNGUS DISEASES OF SHADE TREES.

BY PROFS. W. LOCHHEAD AND M. W. DOHERTY, O.A.C., GUELPH.

It is a matter of common observation that fungi play a very important part in the life of many trees, and frequently the most serious disturbances of their vital processes are brought about by the action of these lowly organized plants. It must not be supposed, however, that

all the fungi, living in vital connection with trees, are harmful, for recent studies show that many of our common trees, such as pine, spruce, tamarack, beech, oak, hazel, hornbeam and birch, have their fine rootlets covered with a sheath of fungous threads by means of which the feeding processes are accomplished. These fungous threads, or mycelium, take the place of the root-hairs of ordinary plants, and absorb the food materials from the soil. There are other examples of the fungi and roots living in intimate vital connection, and for their mutual welfare. Most of the members of the heath family, most of the perennial plants living in meadows on peaty and humus soils, and the members of the legume family, have fungi living symbiotically with the roots.

Inasmuch as fungi are incapable of manufacturing plant-food out of inorganic food-materials, and must feed upon the already prepared food in the decaying vegetable matter of the soil, it becomes highly necessary that the supply of humus be maintained in the form of litter and forest mould in our parks and woods.

The fungi affecting shade trees may, very conveniently, be divided into three classes, according to the parts of the trees they affect: 1. Fungi affecting the roots and base of trunk; 2. Fungi affecting the stems; and 3. Fungi affecting the leaves.

1. FUNGI AFFECTING THE ROOTS AND BASE OF TRUNK.

The entrance of fungi into the roots of trees is determined to a large extent by the conditions of situation and climate. Where the tree has been weakened by any of the physiological causes discussed in the February number of this magazine, the roots are unable to prevent the development of those fungi which find an entrance into the tissues.

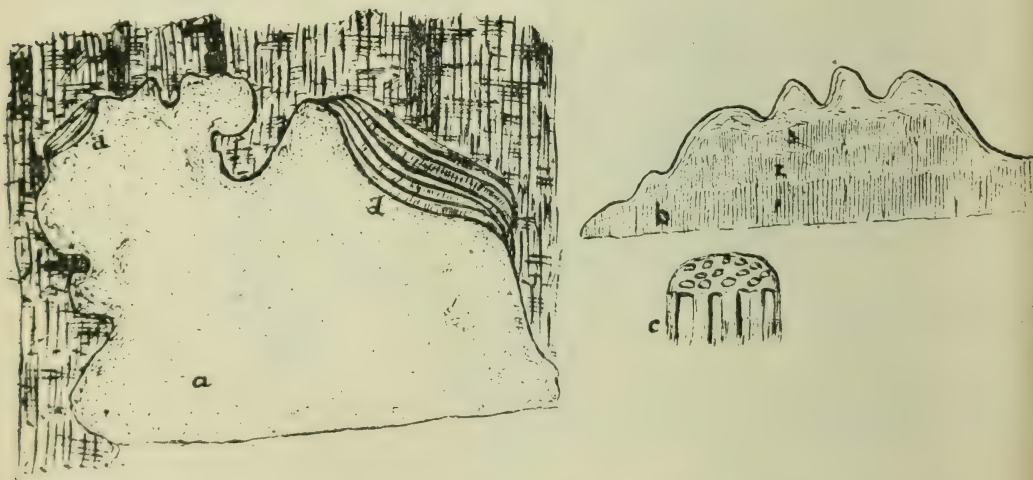


FIG. 12. *Trametes radiciperda* (Root-Rot of Conifers), a, part of a fungus showing the crust following the irregularities of the bark, and the two projecting shelves; b, both composed of several overlapping shelves; c, a section of the crust showing the three layers or thickness of tubes 1, 2, 3; c, a portion of the spore-tube layer showing the tubes and their openings or pores slightly magnified. (After Massee.)

(a) TREE ROOT-ROT. (*Agaricus melleus*.)—This destructive toad-stool is a very common fungus, not only on all kinds of fruit trees, but also on the forest trees, shade trees and conifers. The cap of the toad-stool, when full grown, is two inches across, and has a honey color. The stock is often four inches high, and the gills and spores are white.

The spores are distributed by the wind chiefly. On germination delicate, cob-web-like threads are produced, which soon form a blackish covering on the roots. The roots are penetrated by the threads, which make their way between the bark and the woody part. Gradually the whole mass of tissue of the cortex of the root, as high as the crown, is literally choked with the fine threads, and the vital activities of the plant are seriously interfered with. During late stages of the disease I have frequently seen the surface of the almost dead roots covered with a matted, white felt of threads.

The fungus is not content to remain on a single tree, but will send out dark, radiating threads through the soil to roots of other trees, which are attacked in a manner similar to the first.

REMEDIES. From what has been already said it is evident that there are two sources of infection of trees ; (a) by spores, and (b) by the fine black radiating strands underground. These two sources suggest two methods of treatment : (a) by preventing the formation of the spores on the gills of the cap, and (b) by isolating infested trees, for it is impossible to kill the fungus after it has once made an entrance into the roots. All the fruiting forms, or caps, should be destroyed by burning. Infested trees, which are considered too valuable and healthy to destroy, should be isolated by a ditch about ten inches deep, dug around the tree. This will prevent the underground strands from reaching other trees.

The disturbances produced by the presence of fungal threads are far-reaching. The transpiration of water, when the leaves are affected, is seriously interfered with ; the cells of the parts affected are gradually destroyed through the consumption of the cell-contents ; and chemical changes are initiated which results frequently in the malformation, hypertrophy of tissues ; and finally death ensues.

(b) **ROOT-ROT OF CONIFERS.** *Trametes radiciperda*. (Fig. 12). This is a very common fungus on roots of conifers. The mycelium may pass from a diseased root to another close by which is not diseased, and in this way a single tree may infect a large number. On infection, the cells of the wood become brown, and white patches make their appearance. Flatish, fruiting structures form on the surface of the roots, while the shelf which appears on the roots and stumps resembles a white crust or cake, nearly an inch across. The upper surface of the little shelf is brown, and the lower surface is white. In all cases, save the Scotch pine, the disease soon ascends into the stem. Moreover, it is thought that mice and other burrowing animals assist in the dissemination of the spores.

REMEDY. As with *Agaricus melleus*, the shelves should be removed to prevent the spread of spores, and a ditch dug about the diseased tree to prevent the infection of the roots of neighboring trees.

2. FUNGI AFFECTING THE STEMS OF TREES.

(a) **HEART-WOOD ROTS.** (*Polyporus* sp.) One of the most common objects seen in parks and woods is the large shelf-like fungus projecting from the trunks of both living and dead trees. The various species have quite characteristic shelves—e.g., the shelf on the birch is shaped like a horse's hoof, that on the oak and willow is crisp and wavy margined, while other forms may be hemispherical. (Figs. 13 and 14).

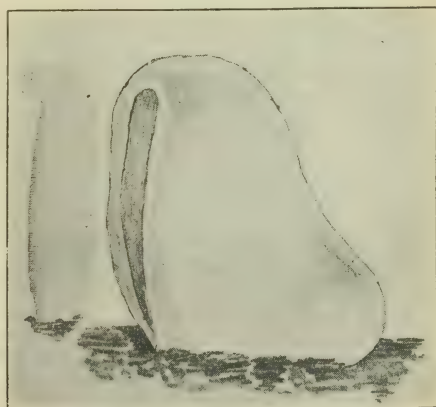


FIG. 13. *Polyporus betulinus* (Birch shelf fungus), showing the horse-shoe shaped shelf. (After Massee).

The heartwood is usually the first region injured, afterwards the sapwood. Wherever a crack or wound permits the thread of the internal mycelium to get to the surface, one or more of the shelves will be found. It is by means of wounds that the mycelium, produced by germinating spores, finds an entrance into the inside of the tree. In a few years the heart of a tree may become entirely rotten; but it is "usually several years from the time a tree is first attacked until its death." The majority of these shelf-fungi spread by means of spores liberated from minute pores on the under side of the shelf; while a few, like the root-rot fungus, spread chiefly by underground mycelia, "from tree to tree along decaying roots."

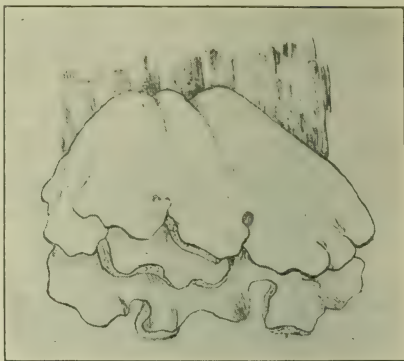


FIG. 14. *Polyporus sulphureus* (Heartwood Rot), showing the irregular and wavy margin. (After Massee.)

Remedies. In the case of trunk-infesting forms, the fungous shelf ought to be destroyed whenever it is seen, thereby preventing the liberation of the minute spores. All broken branches, moreover, should be carefully trimmed and treated with some protective fungicide, such as tar. With root-infesting forms, where the mycelium crawls from tree to tree by means underground, decaying roots, it becomes necessary to remove the cause of the spread. The earth at the base of the tree may be freed from all decaying roots, and all injuries carefully treated with tar.

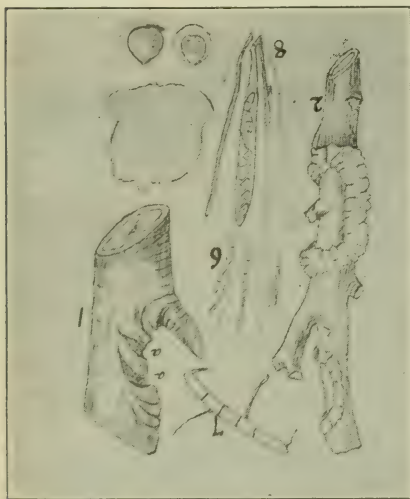


Fig. 15. *Nectria ditissima* (Apple-tree Canker): (1) a branch recently attacked, the disease entered at the axil of the small branch, a perithecia; (2) a branch diseased for some time, showing the rugged, raised margin about the wound; (6) conidia spores; (7) germinating conidium spore; (8) ascus containing spores—the asci are contained in the perithecia. (After Massee.)

(b) **CANKERS** (*Nectria* and others). The cankers are not nearly such conspicuous objects as the shelf-fungi. Some of the cankers have dark colored fruiting forms, while others have bright red forms. Nearly every kind of forest and shade tree is liable to infestation by these fungi, and the infested trees are sources of rapid spread of the disease to the other trees of the park.

The most common cankers are the Apple Tree Canker, Spruce Canker, Larch Canker, and the Coral Spot Canker. (1) The Apple Tree Canker (*Nectria ditissima*) is very frequently found on the common forest and shade trees. Gaining an entrance through a wound, the mycelium attacks the bark, which it destroys in a characteristic manner. As the bark cracks concentrically, the area of diseased portion gradually enlarges, so that sometimes the trunk is completely girdled. Usually the diseased area is surrounded by a thick, irregular margin, which is also quite characteristic. In late fall whitish cushions of mycelium come to the surface, and produce minute spores, while in spring bright red cavities appear, containing the asci and spores. (Fig. 15).

(2.) The Spruce Canker, (*Nectria cucurbitula*), is

chiefly found on the spruce. The fungus gains an entrance through a wound, and attacks the tissues of the cortex and to some extent the wood. When the bark becomes moist the mycelium may come to the surface and produce minute spores, and later in the season red perithecia are formed, and spores are liberated from asci.

(3.) The Coral Spot Canker, (*Nectria Cinnabarina*), is often seen on maples, horse-chestnuts, and red currants. This fungus is most commonly found on dead twigs and branches, where the bright coral-like warts are frequently very conspicuous. Like the spruce-canker the spores germinate on being brought to a wound, and the mycelium makes its way into the tissues beneath. The coral warts are not observed until the death of the twig.

(4.) The Larch Canker (*Peziza willkommii*). (Fig. 16). In low-lying regions the larch is frequently attacked by this fungus, which has found an entrance through some wound. The presence of resin on the diseased twigs, oozing from cracks in the bark, and yellow, wilted leaves, reveal the progress of the disease. The spores are formed in asci sunken in the infested spots. Year after year the canker spot enlarges, and soon girdles the tree. The fungus may be readily recognized by the saucer-shaped fruiting area; the internal part of the saucer being orange-red, and the outside white and downy.

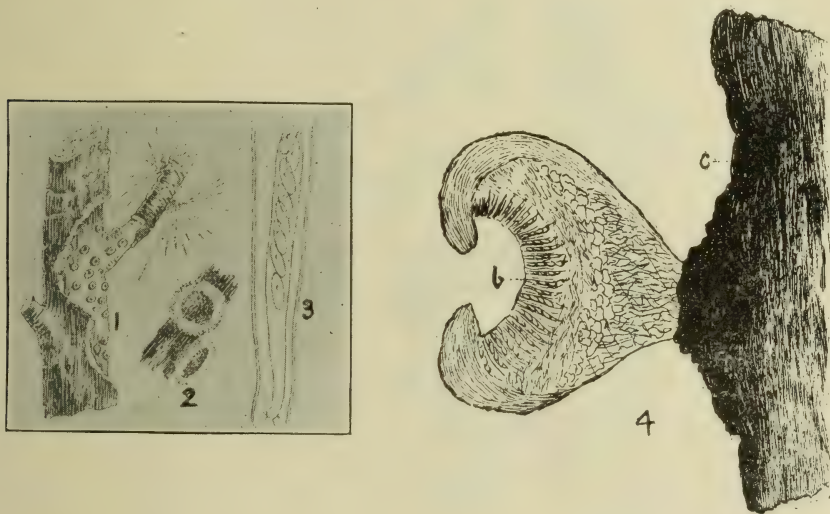


Fig. 16. *Peziza willkommii* (Larch Canker), (1) showing a portion of a branch diseased; (2) two apothecia slightly magnified, (3) an ascus containing eight spores, (4) a section of an apothecium greatly magnified, showing the asci and spores in them (b). (1, 2, 3 after Massee, 4 original.)

REMEDIES. Since all these cankers are wound parasites, it is necessary to keep a strict watch on all our shade trees for wounds. Whenever they are found they should be dressed with a solution of green vitriol, and afterwards with a coating of tar. It is also very essential that diseased twigs be removed as soon as seen, and that the fungus be not allowed to produce spores.

(c) **THE PINE FUNGUS** (*Trametes pini*). (Fig. 17). When fully developed this fungus is readily recognized as one of the shelf-fungi (Polyporids). The shelf is irregularly triangular in form, two or more inches across, of a reddish brown color, and with the cap concentrically grooved. As ordinarily observed the fungus is characterized by white blotches or expansions on the bark, and by the reddish-brown color of the diseased wood.

Inasmuch as the mycelium gains access to the tree through wounds, and the external portion does not make its appearance until the mycelial threads are very numerous within the tissues of the tree, it is the duty of the owner to treat all wounds immediately on discovery, and to remove all trees which show any outward signs of disease.

(d) **PINE CONE FUNGUS** (*Peridermium pini*) (Fig. 18). This fungus is quite a common thing on pines in Ontario. A characteristic feature of the diseased condition of the tree affected is the "resin top," caused by the death of the upper branches through the stoppage of the upward current of sap in the wood. The mycelium is perennial, *i.e.*, growing on from year to year. Cells which are attacked lose their normal content, and secrete turpentine to such an extent that resin frequently overflows from cracks in the bark. Much irregularity in the growth of the trunk of the tree results from the destruction of the cambium. The stage of the fungus which is found on pines is the "aecidial" or cluster-cup stage, appearing in early summer as sausage-shaped swellings filled with spores. (Fig. 18).

REMEDY. The only available remedy is the destruction of the tree, so that the disease may not spread to other trees.



Fig. 17. *Trametes pini* (Pine Fungus). A section of diseased wood, (a) the pores in which the spores are produced, (b) the affected tissue which is saturated with resin and partially decomposed. (Original).

(e) **CEDAR APPLE AND APPLE RUST** (*Gymnosporangium* and *Roestelia*). (Fig. 19). It is well known that certain stages in the life of the rust of wheat (*Puccinea graminis*) are passed on the wheat and the other stage on the barberry. The parasite which causes "apple rust" passes part of its life on apple leaves as *Roestelia*, and the other stage on the cedar or juniper as *Gymnosporangium*. Nine species are known in this genus: two on white cedar only, three on red cedar only, two on both white and red cedars, one on the common juniper, and one on the western juniper (*J. occidentalis*). The mycelium is perennial in most species, and the abnormal growths depend to a certain extent on the part affected, and the rate of growth of the fungal threads. Growths on the affected leaves are called "cedar apples." (Fig. 19). Distorted branches are very common forms of the disease, and are known as "witches broom." The resting spores produced on the cedars and junipers, under favorable conditions, germinate and soon liberate spores of a slightly different nature. These, falling on the leaves of the apple, produce the "apple rust."

(f) **LICHENS.** Lichens are extremely common on all kinds of trees. They form incrustations on the bark, and may be either leathery or semi-gelatinous in texture. It is conceded

by most authorities that the lichens do not get their nourishment from the trees they incrust, but use their position on the bark as a means of getting a better livelihood from the air. The surface of the lichen is specially adapted for absorbing dew, rain or mists very quickly, and their food materials are obtained from the air and the moisture which reaches the plant. Mineral salts are brought to the lichen by the dust in the air, and probably also by the dead



FIG. 18. *Peridermium pini* (Pine Cone Fungus). (a) Leaves of pine affected with this disease. The cluster cups occur as orange yellow blisters and contain the spores. Spermogonia (b) appear as black spots. (B) shows a branch which has been killed and which bears cluster cups. (After Massee.)

bark or the decaying leaves on the bark. Lichens are really dual plants, composed of fungi and algae—the fungi holding the algae as slaves in the mesh-work of the hyphae. The algae, containing chlorophyll, can make organic food out of the inorganic materials at their command, while the fungus can feed upon the organic food thus prepared. (Fig. 20). It is very evident that the lichens which incrust the bark of a tree do much harm, in that the breathing pores

of bark are closed and oxygen is unable to get access to the interior cells. This loss of oxygen is of vital importance to the healthy working of the tree, and all shade and fruit trees should



FIG. 19. A, *Roestelia pirata* on apple leaf; (1) aecidia or cluster cups containing aecidiospores. B, *Gynnosporangium macropus* (1) the cedar apple showing the yellow horns containing the teleutospores or winter spores.

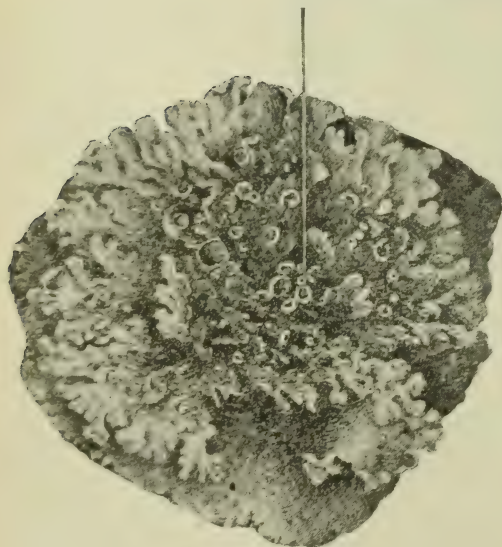


Fig. 20. Lichens.

way the infection is carried to trees in the neighborhood.

The only practicable method of preventing the spread of this fungus is to gather up and burn the leaves before the spores are set free in the spring.

be kept well cleaned. Careful scraping will do much good, but perhaps the best remedy is the application of some strong caustic, such as whale oil soap (2 lbs. to a gallon of water in winter) or fungicide, as Bordeaux mixture.

3. FUNGI AFFECTING THE LEAVES.

(a) MAPLE LEAF BLOTCH (*Rhytisma acerinum*.) (Fig. 21.) Frequently the upper surfaces of the leaves of maples contain large black patches of a fungus nature. These patches make their appearance in June, and are then yellowish in color, but a little later they turn black and thick, forming a sort of scab, due to the fact that the mycelium becomes hard and dense. During the winter, spores are produced in cavities called *asci*, and in the spring they become mature and are liberated. In this

(b) PINE LEAF-CAST (*Lophodermium pinastri*). (Fig. 22.) Sometimes the leaves of young, seeding pines fall prematurely, and, if the leaves are examined, small, oval, black spots may be seen. These are the masses of asci,

each containing eight spores, which rupture only after long-continued wet weather. In some of the islands of the Muskoka lakes large areas of young pine trees were completely defoliated during the summer of 1899 by this fungus.

No remedial treatment can be suggested for this disease, especially after the mycelium has gained an entrance to the inner tissues.

SUMMARY.

Shade trees are liable to attacks from many quarters. Not only are insect enemies plentiful, but fungus enemies are even more abundant, and await the first favorable opportunity to make the attack. These opportunities come quite frequently during the life of an ordinary shade tree. They come when outside conditions are unfavorable to the healthy working of the organs of the tree, when, for example, the food supply is inadequate, the drainage poor, or the water supply extreme. The tree becomes weakened, and in its weakened state

cannot ward off the host of invaders. Wounds brought on by storms of wind or hail, when portions of the bark are bruised, or branches torn off, form very suitable places for the entrance of both fungi and insects. In every case the old adage, "a stitch in time saves nine," holds true, and frequently a little labor at the outbreak will not only save a great amount of labor later on, but also, perhaps, the life of the tree.

The chief insect and fungus enemies of shade trees have been discussed as fully as space would permit, and it must be inferred that the enemies are numerous. The owner who takes great care of his trees—along the lines laid down in these articles—will be abundantly rewarded in seeing his trees "things of beauty and joys forever," while his careless neighbor will probably be lamenting his "hard luck." Shade trees must be treated as living, organic beings—fed with abundant nutritious food, and cared for by attending to their wounds—if they are to furnish that refreshing shade in summer, that peculiar beauty all their own, and that protection from the blasts of winter, which are so much to be desired.



FIG. 21. *Rhytisma acerinum* (Maple Leaf Blotch) showing the sclerotium spots, (a) on a maple leaf. These sclerotia become wrinkled and contain the apothecia with the asci and spores. (Original).

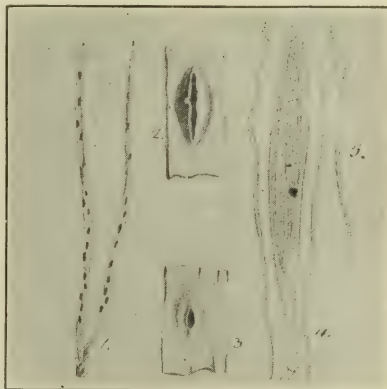


FIG. 2. *Lophodermium pinastri* (Pine-Leaf Cast) (1) leaves with the fungus. Within the apothecia are the club-shaped asci which contain the spores. (After Masee).

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Tenth Annual Report
OF THE
Fruit Experiment Stations
of Ontario

UNDER THE JOINT CONTROL OF THE
ONTARIO AGRICULTURAL COLLEGE, GUELPH,
AND THE
FRUIT GROWERS' ASSOCIATION OF ONTARIO.

1903.

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FRUITS OF ONTARIO.

Described and Illustrated by Mr. L. Woolverton, Secretary of the Board of Control
of the Ontario Fruit Experiment Stations.

Fruit growing has become so important an industry in the Province of Ontario, that it deserves every encouragement at the hands of the Department of Agriculture. The Canadian farmer who contemplates growing fruit asks for information on two points in particular, viz., (1) What fruits shall I plant, and (2) How shall I cultivate them? The latter of these questions it is the province of the Ontario Fruit Growers' Association to answer through the "Canadian Horticulturist" and the Annual Report, while the former question is one that can be solved only by years of patient experimental work by our fruit experiment stations.

Of equal importance is some means of identifying all varieties now grown in our Province, and of knowing with some degree of exactness the size, color, general appearance and real value of these varieties aside from the catalogues of the nurserymen. To meet this latter need, the Secretary, with the advice and approval of the Board of Control has begun the work of illustrating and describing the fruits of Ontario; and in this work he desires to acknowledge the valuable aid of the various fruit experimenters. The illustrations are all new and original, having been engraved from photographs made the exact size of the fruit samples, except where otherwise specified, and in this way there will in time be made accessible to the Ontario fruit growers a complete guide to all the fruits grown in the Province. Such a work necessarily must be slow and tedious, but it is all important that it should be characterized by scientific accuracy, and the writer invites notes or criticism from pomologists generally.

APPLES

TRANSCENDANT.

An excellent early autumn variety of the hybrid crabs.

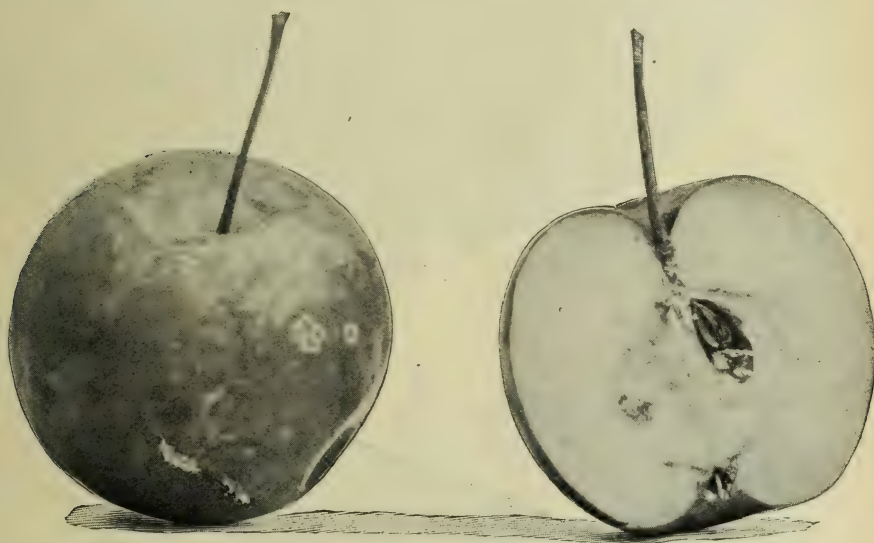
Origin : United States.

Tree : Of moderate slender growth, hardy, somewhat subject to twig blight.

Fruit : Size $1\frac{3}{4}$ inches long by 1 7-8 broad, which is medium for its class ; form roundish oblong, flattened at ends, ribbed ; color of skin golden yellow, with crimson cheek and thin whitish bloom ; stem one and a quarter inches long, set in an open deep cavity ; calyx closed, segments large, set in a hollow, slightly corrugated basin ; somewhat subject to scab.

Flesh : Color yellowish ; texture crisp and moderately firm ; flavor acid, slightly astringent, becoming pleasant when fully ripe.

Season : August and September.



Transcendant.

COLVERT.

A fairly good fall market apple, being large in size and rather attractive in appearance, but of fair quality. It has been widely planted in Ontario for market. For kitchen use it is much inferior to the Gravenstein.

Origin : Uncertain.

Tree : Very vigorous and very productive.

Fruit : Large, $3 \times 3\frac{1}{2}$ inches ; form oblate, slightly conical ; skin greenish yellow, with cheek and faint stripes of dull red ; stem stout, half an inch in length.

Flesh : Color greenish white ; texture tender, moderately juicy ; flavor sub-acid, ordinary.

Season : October to November.

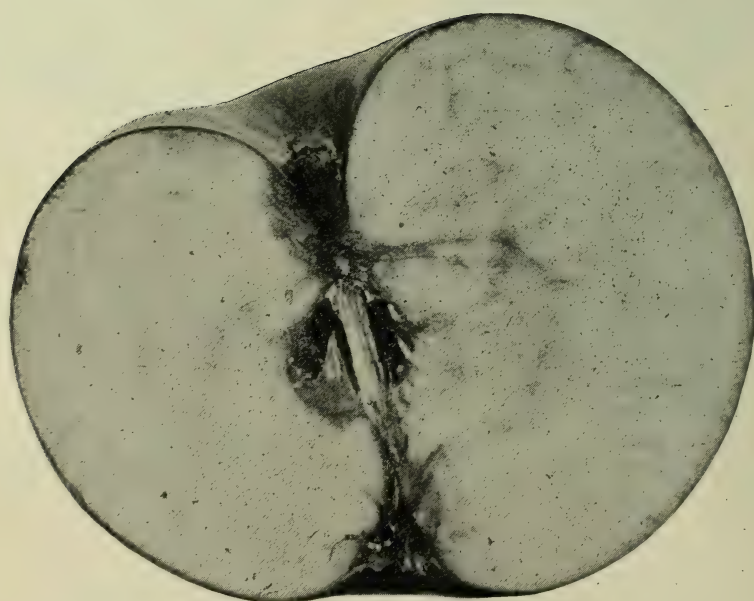
Quality : Dessert, fair ; cooking, good.

Value : Second grade for market, as compared with Gravenstein.

Adaptation : Succeeds at Georgian Bay and Bay of Quinte stations, and is widely grown in the older apple sections of Ontario.



Colvert.



Section of Colvert.

FALLAWATER.



Fallawater.

A large apple, of even size and fine appearance, which is grown for market quite extensively in Pennsylvania, Ohio, and in some of the Western States, and to some extent in Ontario. Were it more uniformly productive, we could recommend it as a profitable commercial variety.

Origin: Pennsylvania.

Tree: A vigorous grower; fairly productive.

Fruit: Size large 3 x 3½ inches;

form round, regular, smooth; color pea green, shaded on sunny side with brownish red cheek dots sparse, large light green; stem half an inch long, stout set in a narrow, moderately deep cavity; calyx small, nearly closed, set in a shallow wrinkled basin.

Flesh: Greenish white; texture fine-grained, firm, moderately juicy; flavor mild subacid, fair.

Season: January to March.

Quality: Fair for cooking.

Value: First-class.

Adaption: Successfully grown at our Bay of Quinte station and all parts of the Province farther south; also in the Lake Huron district, but in some localities it is said to be short-lived.



Section of Fallawater.

HUBBARDSTON. (*Hubbardston's Nonsuch.*)

Hubbardston.

A first - class commercial apple for early winter. It succeeds well in the Province of Ontario, and deserves to be planted much more freely.

ORIGIN :
Hubbardston,
Mass.

Tree : Hardy, vigorous and very productive.

Fruit : Size, medium to large, attaining a diameter of three inches and three-quarters in length by three and a quarter in width ; form round ovate; fairly regu-

lar ; skin rich yellow ground nearly covered with stripes and splashes of light rich red ; stem three-quarters of an inch long, set in a narrow deep russetted cavity ; calyx open in a ribbed basin.

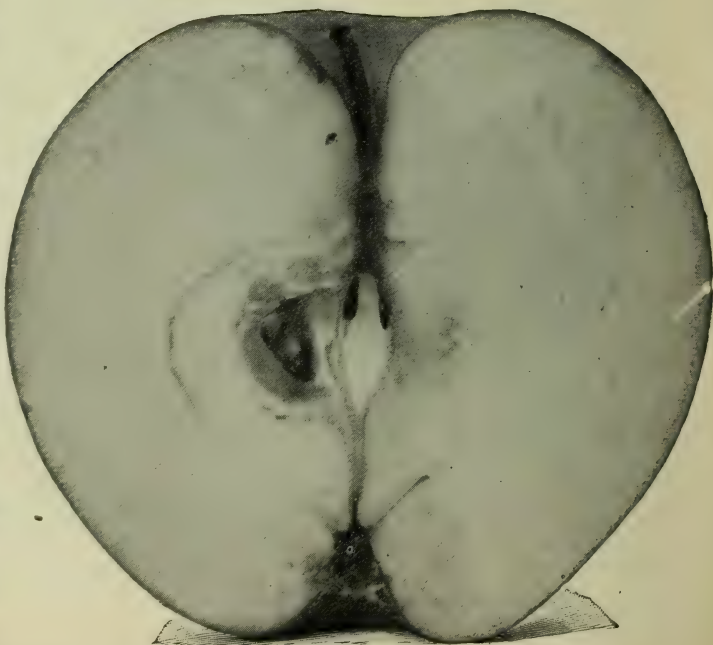
Flesh : Texture tender and juicy ; flavor subacid, rich, sweet and excellent.

Quality : Very good.

Value : Market first-class.

Season : October to February.

Adaptation : Reported successful in the Counties of Simcoe Prince Edward and Norfolk.



Section of Hubbardston.

HYSLOP.

A well known and widely cultivated variety of hybrid crab. Its dark, rich, red color and its late season make it a valuable variety.

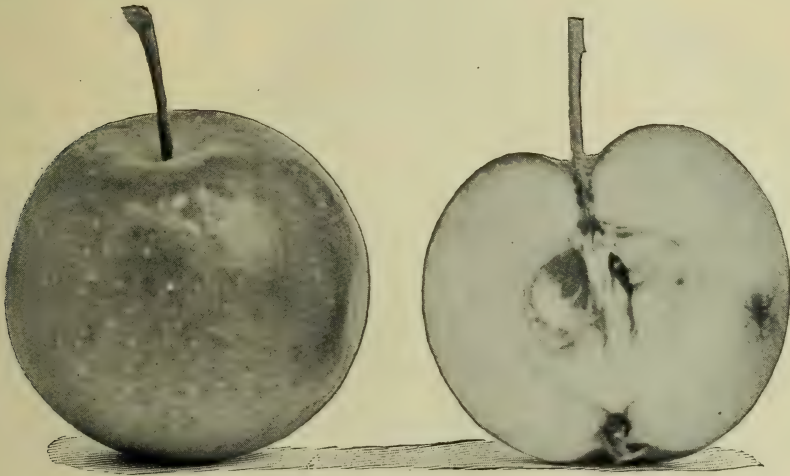
Tree : Vigorous, of spreading habit.

Fruit : Size $1\frac{3}{4}$ inches by 1 7-8 ; form roundish ovate, obscurely angular ; color a dark rich red, covered with heavy blue bloom, and having many obscure yellowish dots ; stem about one inch and an eighth in length, set in an obtuse, regular cavity.

Flesh : Yellowish, acid.

Season : September and October.

Value : Very good for culinary uses and for cider.



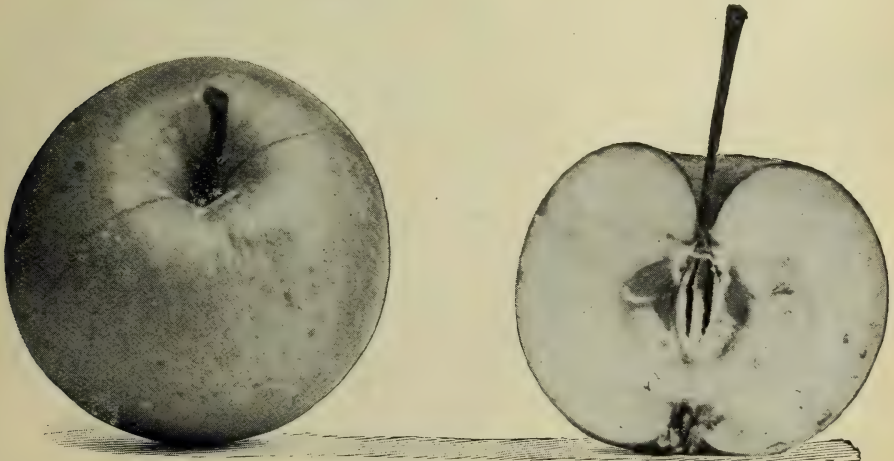
Hyslop.

ORANGE.

A fairly good dessert variety of hybrid crab.

Origin : United States.

Tree : A slow grower, productive.



Orange.

Fruit: Size medium, $1\frac{1}{2}$ inches by $1\frac{7}{8}$; form round, slightly flattened at the ends; color light orange, with minute white dots and russet veins; stem slender, $1\frac{1}{4}$ inch in length, set in a deep open cavity; calyx closed, in a furrowed basin.

Flesh: Color yellowish, yellow veinings; texture a little dry; flavor mild, pleasant, acid.
Season: September.

PHOENIX.



Phoenix.

small grey dots; russeted about the cavity and green about the basin; stem $\frac{1}{2}$ inch long in a funnel shaped cavity; calyx half closed.

Flesh: Creamy-white, coarse grained, somewhat juicy; flavor mild, acid, pleasant.

Quality: Dessert, poor, cooking, good.

Value: Very good for export, if shipped early.

Season: December to February.

A fairly profitable commercial apple in some parts. It is grown in Northumberland county and in some other apple sections in the Province, and by some growers is ranked equal to the Baldwin for profit.

Origin: Illinois.

Trees: Healthy and productive.

Fruit: Medium to large, measuring $2\frac{1}{2}$ x 3 inches; roundish, sometimes quite one-sided; color greenish yellow ground well covered with deep red, obscurely striped with a darker shade, and having a few



Section of Phoenix.

GRAPES.

BRIGHTON.

The fine size of its bunches and the excellence of its flavor as a dessert grape gave promise, in its first introduction, that the Brighton would be a popular commercial grape in Ontario ; but in this we have been disappointed, because of its susceptibility to mildew, and its poor shipping quality. The latter point is of importance to our Ontario fruit growers, who look forward to the great Northwest as one of the best markets for the product of their vineyards.

As a dessert grape the Brighton is worthy of a place in every fruit garden which is planted for home uses.

Origin : Raised by Jacob Moore, Brighton, N. Y. ; a cross between Concord (Labr) and Diana Hamburg (Vinifera).

Vine : Vigorous ; semi - hardy ; productive ; somewhat subject to mildew ; leaves large, thick, dark green ; pollen sometimes defective, and the vine should have other varieties which are good pollenizers planted near it.

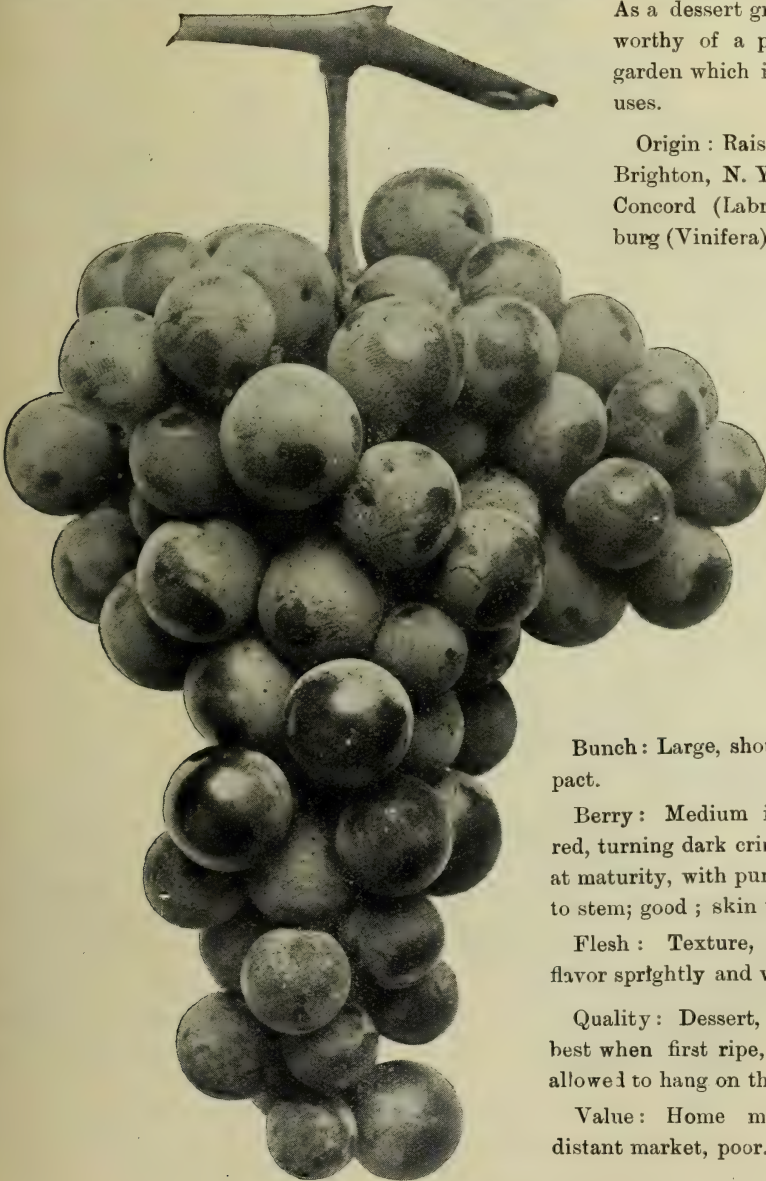
Bunch : Large, shouldered, fairly compact.

Berry : Medium in size ; color light red, turning dark crimson or almost black at maturity, with purple bloom ; tenacity to stem ; good ; skin tender.

Flesh : Texture, tender and juicy ; flavor sprightly and very pleasant.

Quality : Dessert, very good, at its best when first ripe, but deteriorates if allowed to hang on the vine.

Value : Home market, very good ; distant market, poor.

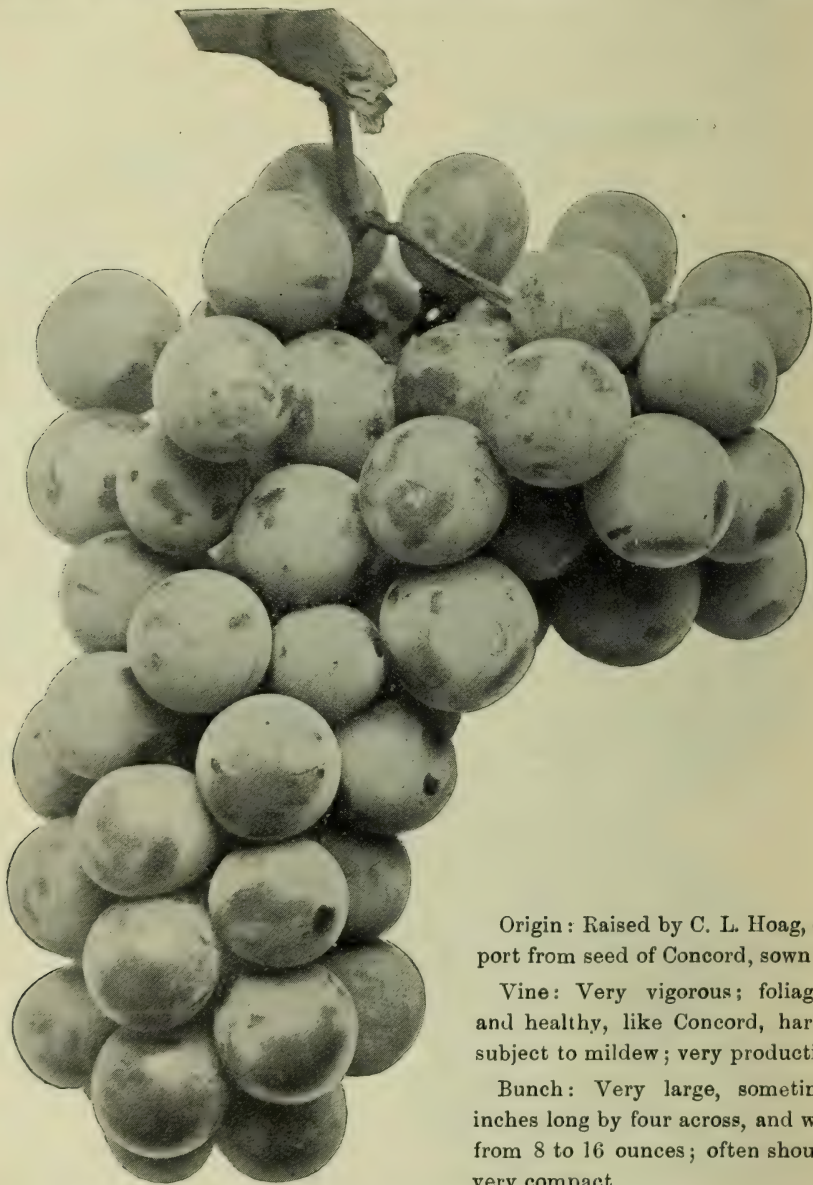


The Brighton Grape.

Season : September, with Hartford Prolific ; not a long keeper.

NIAGARA.

The Niagara is the leading white grape in Ontario, for commercial purposes. In health, vigor of vine and in productiveness it has no superior, and it has been planted more widely than any other variety except the Concord. For dessert purposes it is good in quality when well ripened. We do not recommend it for sections north of Toronto, unless in favored locations.



Origin : Raised by C. L. Hoag, of Lockport from seed of Concord, sown in 1868.

Vine : Very vigorous; foliage thick and healthy, like Concord, hardy, not subject to mildew; very productive.

Bunch : Very large, sometimes six inches long by four across, and weighing from 8 to 16 ounces; often shouldered; very compact.

Berry : Round, about the size of Concord; pale green turning to pale yellow at maturity, and covered with a thin whitish bloom; skin tough and not inclined to crack; pulp soft, juicy and sweet, of good flavor when fully ripe, with a touch of muskiness.

Quality : Dessert, good; canning very good.

Value : Home markets, first-class.

POCKLINGTON. (Golden Pocklington.)

This grape was first shown at the New York State Fair, Rochester, in 1877, and was at that time considered the largest and finest white grape of purely native origin, and was largely planted for commercial purposes. However, since the introduction of the famous Niagara, the Pocklington has been almost lost sight of, and is very little planted.



Pocklington.

Origin: A seedling of Concord, raised by John Pocklington, Sandy Hill, N.Y.

Vine: Of medium vigor; moderately productive; healthy, resisting mildew and rot; of Labrusca (Concord) parentage.

Bunch: Size, 4 1-2 x 3 inches, with small shoulder, fairly compact.

Berry: 1 13-16 of an inch in diameter; round; color pale green, turning golden yellow; flesh pulpy, but tender and fairly juicy; flavor sweet, somewhat foxy; drops from stem after gathering.

Quality: Dessert, fair.

Value: Home market, fair; distant market, poor.

Season: End of September and October; about a week later than Concord.

TRANSPARENT.

Valuable in Ontario only as a wine grape.

Origin: Seedling of Taylor, by Jacob Rommell, of Missouri.

Vine: Vigorous,
productive, free from
mildew and rot.

Bunch: Compact,
shouldered, six inches
long by three and a
half broad.



Transparent.

Berry: Firm, round; diameter, 5-9 of an inch; color, pale greenish yellow, transparent, with thin grey bloom; skin, thin; pulp, tender, juicy; flavor, fine and sweet.

Season: End of September.

Adaptation: Southern sections of the Province.

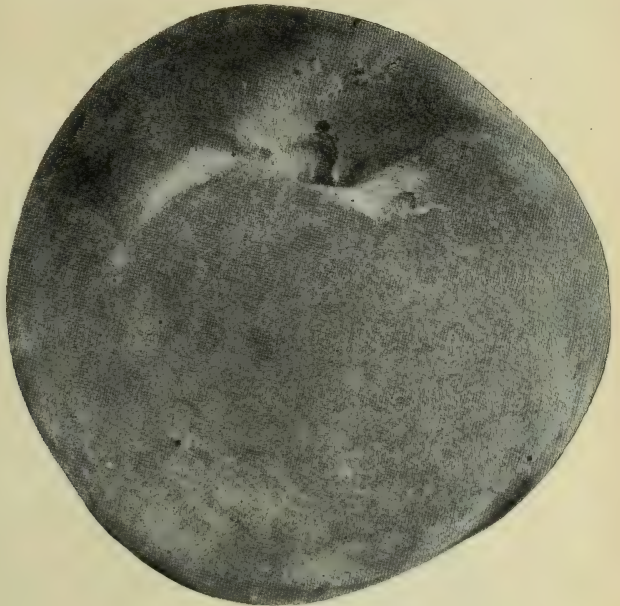
PEACHES

LEMON CLING.

A large and showy peach, at one time planted freely in Ontario peach orchards, but of late discarded because of its cling stone.

Origin : South Carolina.

Tree : Vigorous, hardy and productive.



Lemon Cling.

Fruit : Size, large, 3 1-2 x 3 inches ; form, roundish, narrowed towards apex, which is large and prominent, somewhat like that of the lemon ; skin, deep yellow, with a dark brownish-red cheek.

Flesh : Color yellow, tinged with red at the pit ; texture firm, not very juicy ; flavor pleasant, sprightly, sub-acid.



Section of Lemon Cling.

Season : Last half of September.

Quality : Dessert, fair ; cooking, fair.

Value : Market, fair.

PEARS

GIFFARD.

(Beurre-Giffard.)

A very desirable commercial pear for the home market.

Origin : A chance seedling about 1840, in the garden of M. Giffard, Angers, France.

Tree : Fairly vigorous ; a straggling grower ; healthy ; fairly productive.

Fruit : Size, medium to large, 3 1-2 x 2 1-2 inches ; form pyriform conical ; color



Giffard.

Section of Giffard.

light green, with red dots and marbling of red on the sunny side ; stem one inch long, stout, swollen at the base, set obliquely ; calyx half closed, in small, shallow basin.

Flesh : Color white ; texture melting, juicy ; flavor, vinous, perfumed.

Quality : Dessert, very good ; cooking, best.

Value : First-class for home market.

Season : August 10th to 15th ((1902).

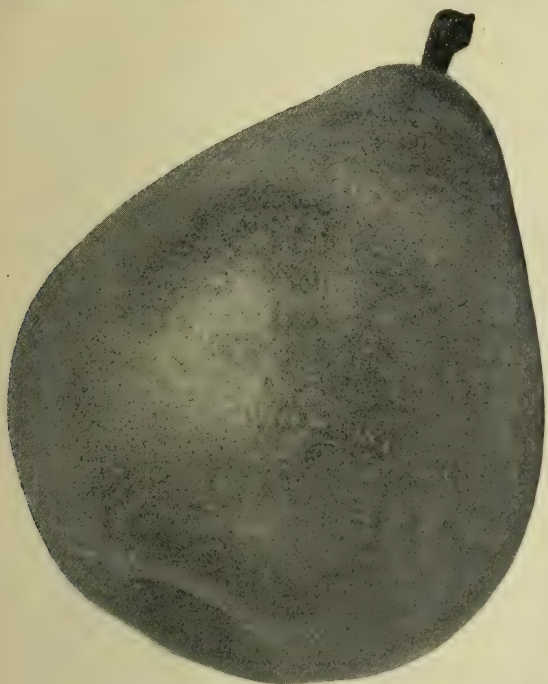
GOODALE.

A very good late fall pear ; ; promising as a market variety.

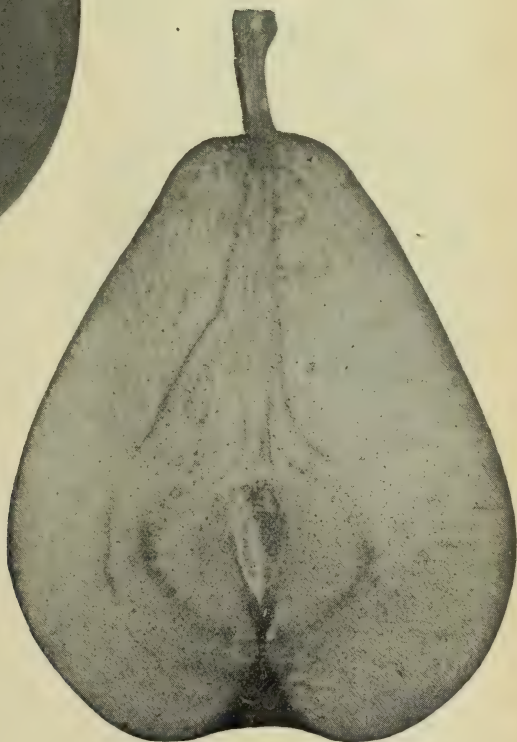
Origin : Seedling raised by F. Goodale, Saco, Maine.

Tree : Very vigorous and hardy and uniformly productive.

Fruit : Large, obovate obtuse pyriform ; color green, yellowing at maturity, with crimson cheek, some russet patches, and some small brown dots ; stem about 5-8 of an inch long, set in an inclined cavity ; calyx small, closed, in a small, rather deep basin.



Goodale.



Section of Goodale.

Flesh : Color white ; texture fine, juicy, granular at core ; flavor sweet, pleasant, perfumed.

Quality : Good.

Value : Dessert, fair ; market, good.

Season : October.

OSBAND.

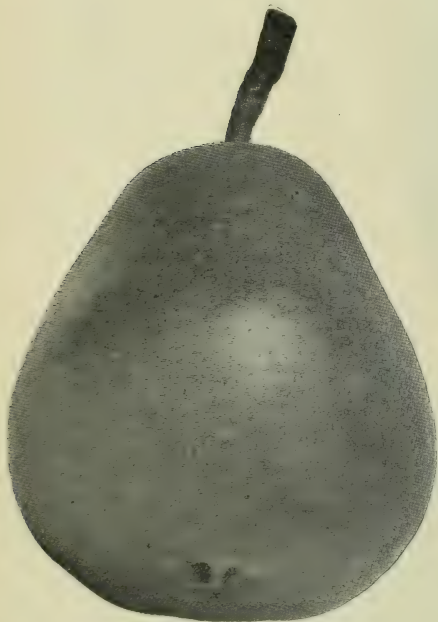
(Osband's Summer.)

Widely grown in North America. A good dessert pear for home garden, but the fruit is small and the tree too scant a bearer to be profitable.

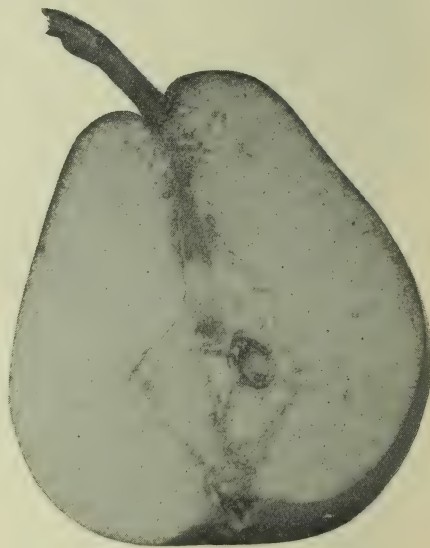
Origin : Wayne County, New York State.

Tree : A moderately upright grower, healthy, fairly productive, an early bearer.

Fruit : Size, 2 x 2 1-4, sometimes averaging 1 1-2 x 2; form obovate, slightly pyriform, regular; color yellowish green, turning quite yellow at maturity, with a brownish red cheek, and numerous small green and brown dots; stem, 7-8 of an inch long, set



Osband.



Section of Osband.

in a small, abrupt cavity; calyx half open, in a broad, slightly depressed basin; core small; seeds small.

Flesh : Color white; texture fine-grained, juicy; flavor perfumed, sweet, rich and pleasant.

Quality : Dessert, very good; cooking, fair.

Value : Home market, fair; distant market, poor.

Adaptation : Southern Ontario.

Season : 10th to 20th of August.

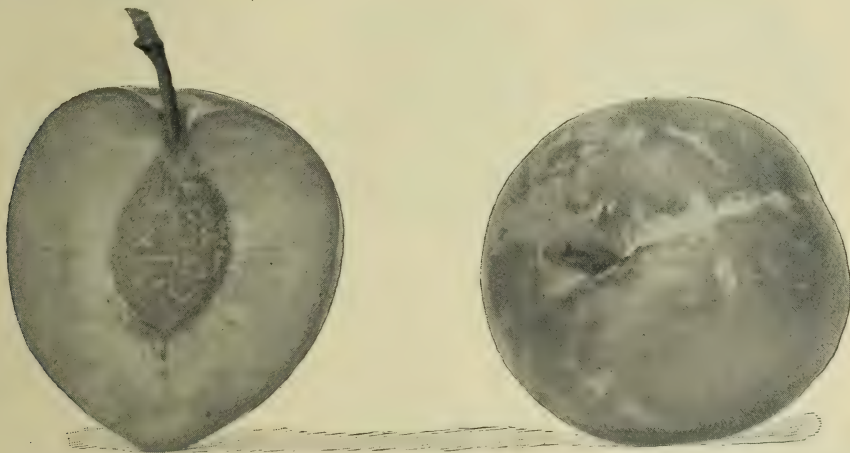
PLUMS

CHABOT. (Yellow Japan. Bailey.)

This is the best Japan plum of its season, which is about two weeks later than that of Burbank.

Origin: Imported from Japan by Mr. Chabot, of Berkeley, Cal., and introduced to the trade by Mr. Luther Burbank in the year 1896.

Tree: Very vigorous, forming a fine, large, symmetrical head; productive; an early bearer; hardy.



Chabot.

Fruit: Medium to large for a Japan plum; 1-8 x 1-2; form, oblong-conical, almost heart shaped; color, red, with pinkish bloom and numerous minute yellowish specks; stem 3-4 inch long, stout; apex a point in a narrow, deep depression; suture traceable; very attractive in appearance.

Flesh: Color yellowish; texture moderately firm and juicy; flavor sweet, perfumed, very pleasant; clings to stone.

Season: September 1 to 15 (1902).

Quality: Dessert, good; cooking and drying, very good.

GREEN GAGE.

The Green Gage and several varieties of the same type are of especial value for culinary purposes. For pies, sauce or canning purposes, they seem to be growing in demand year after year, and no collection of plums for the home garden is, therefore, complete without a tree or more of this or some other variety of this family. With Ontario fruit growers, the most popular Gage is the Reine Claude de Bavay, commonly known among them as Reine Claude, which name is also an old synonym of the Green Gage. In the catalogue of the American Pomological Society it is called Bavay. The fruit of this latter variety is in good demand among canners, and brings a fair price in our markets.

Origin: This type of plum was brought from Italy to France about the year 1500 by Queen Claudia, wife of Francis I., after whom it was named Reine Claudia. Later, some trees were brought to England by a family named Gage, but the label on these trees being lost, the gardener called them Green Gage. Hogg, the English pomologist, however, tries to prove that this plum had been introduced into England before this time under the name of Reine Claude, and hence arose considerable confusion of names.

Tree: Productive; hardy, a slow grower.

Fruit: Roundish; size medium; skin greenish, yellowing towards maturity, with a thin whitish bloom and a few red dots; stem three-quarters of an inch long, set in a small, abrupt cavity; suture traceable.

Flesh: Color pale green; texture melting and juicy; flavor, rich, sweet and excellent; pit mostly free.



Green Gage.

Quality: Cooking or canning, best; dessert, very good.

Value: Home market, good.

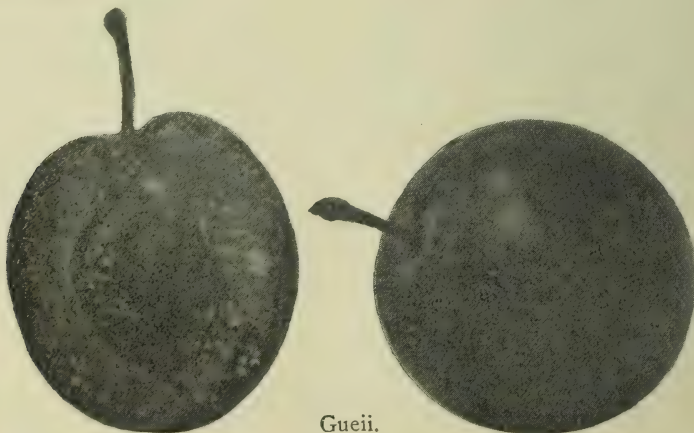
Season: Middle to end of August.

GUEII (Blue Magnum Bonum).

A valuable plum for the commercial orchard, probably the best of its season; planted quite generally for market in the southern parts of the Province.

Origin: With Mr. Hagaman, Lansingburgh, N.Y., about 1850. It was named after John Goeway (pronounced Gueii), who was the first to cultivate the plum extensively, and it has of late been spelled after the pronunciation.

Tree: An upright, vigorous grower, becoming more spreading with age; hardy; an early and abundant bearer.



Gueii.

Fruit: Size, medium to large; 1.5-8 x 1.5-8; form, roundish ovate, narrowing slightly toward apex; color, very dark purple, with blue bloom; stem, 1-2 inch long, slender, set in a large, deep cavity; suture very slight; apex a small point.

Flesh: Color pale yellow; texture firm, juicy; flavor, moderately sweet, pleasant; almost free of stone.

Quality: Dessert, fair; cooking, very good.

Value: Home market, very good.

Season: End of August to first week of September.

Adaptation: Succeeds well at Burlington.

PURPLE EGG (Hudson River Purple Egg).

A good commercial variety, especially for preserving.

Origin: On the banks of the Hudson River, New York State, exact locality not known.

Tree: Upright, vigorous grower, hardy and very productive.

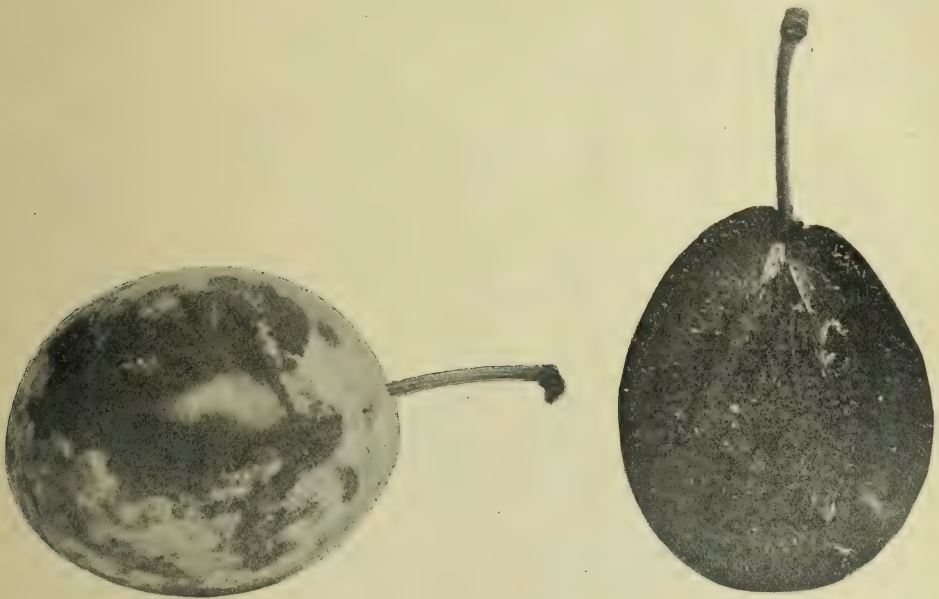
Fruit: Size large; form ovate, often necked; color of skin, dark, rich red to purple; stem long in a deep cavity; suture shallow; bloom thin; clings to stone.

Flesh: Color, greenish yellow; texture firm; flavor brisk acid.

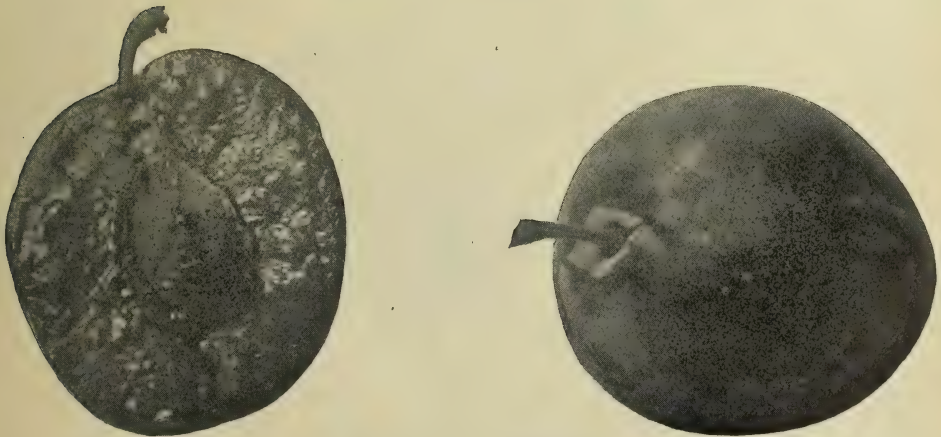
Quality: Dessert, poor; cooking, very good.

Season: Last half of September.

Adaptation: A success in Niagara district, at the Burlington and Georgian Bay stations.



Hudson.



Washington (Reduced).

WASHINGTON.

Not productive enough, nor good enough a shipper to be popular in the commercial plum orchard ; but, on account of its large size, beauty and excellence of quality, a universal favorite for the dessert table.

Origin : New York City, as a sucker from a grafted tree, which was purchased from a market woman by a Mr. Balmer. He first fruited it in 1818, and the plum was at first called Balmer after him.

Tree : A strong, vigorous grower ; fairly productive ; foliage, remarkably large, broad and glossy.

Fruit : Size large ; form round oval ; suture traceable, very distinct near the stem ; color dull yellow, changing to deep yellow, marked with crimson dots and covered with pale bluish, grey bloom ; stem three-quarters of an inch long, set in a wide, shallow cavity.

Flesh : Yellow ; texture firm ; flavor rich, sweet and luscious.

Quality : Dessert, very good ; cooking, very good

Value : Home market, first-class.

Season : End of August.

RASPBERRIES

SMITH'S GIANT.

A very promising black raspberry for the commercial plantation.

Origin : With A. M. Smith, fruit grower, St. Catharines, Ont.

Plant : Vigorous, fairly hardy and quite productive.

Fruit : Very large, black, with heavy bloom.



Smith's Giant.

Quality : Dessert or cooking, very good.

Value : Market, one of the best.

Season : Late, July 15th to August 1st.

Adaptation : Tested at Burlington, Walkerton, Guelph, and Craighurst, and found hardy.

FRUIT RECOMMENDED TO ONTARIO PLANTERS.

APPLES.

List of the Most Valuable Varieties.

Summer.

Red Astrachan : Adapted to all sections except the extreme north.

Duchess : Adapted to all sections.

Fall.

Gravenstein : Adapted to all sections except the St. Lawrence River district and other northerly portions of the Province.

Wealthy : Particularly valuable for northern sections.

Alexander : For northern sections.

McIntosh : Adapted especially to the St. Lawrence River district, but can be grown over a much wider area.

Fameuse : Adapted especially to the St. Lawrence River district, but succeeds well over a much wider area.

Blenheim : Adapted to all sections except the St. Lawrence River district and other northerly portions of the Province.

Winter.

King : Adapted only to the best apple sections, and succeeds best when top grafted on hardy stocks.

Hubbardston : Adapted to the best apple sections.

Greening : Adapted to the best apple sections.

Cranberry : Requires good soil and is adapted to the best apple districts, but especially southern Ontario.

Baldwin : Succeeds best on clay land, and is adapted to the best apple districts.

Northern Spy : Adapted to the best apple districts, but can be grown with success further north by top grafting on hardy stocks. This is also a good method of bringing it into early bearing.

Ontario : An early and abundant bearer, but short lived. Recommended as a filler among longer lived trees. Adapted to same districts as Northern Spy, which it somewhat resembles.

Stark : Adapted to best apple districts.

Varieties Especially Adapted to Home Use.

Summer.

Yellow Transparent : Adapted to all sections.

Primate : Adapted to best apple sections.

Sweet Bough : Adapted to best apple sections.

Duchess : Adapted to all sections.

Fall.

Chenango : Adapted to best apple sections.

Gravenstein : Adapted to best apple sections.

Wealthy : Especially adapted to northerly sections.

McIntosh : Especially adapted to northerly sections.

Fameuse : Especially adapted to northerly sections.

Blenheim : Adapted to best apple sections.

Winter.

King : Adapted to best apple sections. Should be top grafted.

Wagener : Adapted to best apple sections.

Swayzie Pomme Grise : Adapted to all sections except most northerly.

Greening : Adapted to best apple districts.

Talman Sweet : Adapted to best apple districts.

Northern Spy : Adapted to best apple districts, but will succeed further north if top grafted.

Mann : Adapted to best apple districts, but will succeed further north if top grafted.

Summer : Yellow Transparent, Charlamoff.

Hardy Varieties Recommended for Sections North of Latitude 46 degrees.

Summer : Yellow Transparent, Charlamoff.

Fall and Winter : Duchess, Wealthy, Hiberna, Longfield, Patten's Greening, Whitney Crab, Hyslop Crab.

Fruit Experiment Stations

REPORT OF THE INSPECTOR.

By Prof. H. L. Hutt, Ontario Agricultural College, Guelph.

I have the honor of presenting my tenth annual report of the work of the Fruit Experiment Stations.

In the first place, I may say I am pleased to report good work on the part of the stations. We have been fortunate in securing in our experimenters a number of the best informed fruit growers of the Province, nearly every man of whom is a specialist in some particular line; therefore the reports which they are making from year to year are of inestimable value to the farmers and fruit growers of this country.

All of the stations were visited this year with the exception of the "Pioneer Farm," at Wabigoon, where the fruit plantation is only nicely being started. Each station was visited as nearly as possible at the most opportune time for seeing the fruits especially under test. I was thus on the go at various times throughout the summer from the time the strawberries were ripe in June till the apple harvest in October.



Bird's eye view of W. H. Dempsey's orchard and home, Trenton, Ont.

For my own information, I took notes of the leading varieties as grown at each station, but as this is information which should come directly from the experimenters, I have left it to be dealt with in their reports.

By the use of my camera during the past two seasons, I have been able to get a number of excellent photographs at each of the stations which may be of use to illustrate the reports of the experimenters. A liberal use of these in our annual report should add much to its value, for often a good photograph conveys as much to the average reader as a page of print.

The past season was, on the whole, an excellent one for fruit, and most of our experimenters were favored with abundant crops. At a number of stations many new varieties are coming into bearing, which will afford interesting material to report upon. One of the difficulties which many of our experimenters are experiencing is to be sure that the trees or plants of these new varieties are true to name. Already I have come upon quite a number which were not what they were obtained for. In Mr.

Dempsey's collection of apples, where he has already 400 varieties on his list, and is adding new ones every year, this is a matter which requires much careful attention. The authorities in connection with the Department of Agriculture at Washington have kindly offered assistance in matters of this kind, which we are pleased to accept. This fall Mr. Dempsey and I collected samples of about fifty new varieties which have lately begun fruiting there, and forwarded them to Washington for verification, but as yet I have not heard from Mr. Dempsey as to their report upon them.

In reporting this season I have thought it hardly necessary to go into details of the work of each station, as that has been done repeatedly in previous reports, so I shall refer to those only which call for special mention.

One of the most remarkable apple crops seen in my travels this year was in Harold Jones' orchard at Maitland. Many of his Snow and Scarlet Pippin trees were literally crushed to the ground with the weight of fruit, notwithstanding all his efforts to keep them up with ropes and props. The quality of the fruit was exceptionally fine. Nowhere else have I seen such fine Snows as are grown in that section. In this connection I may say that the more I travel the more I am convinced that the question of varieties is very much a local one after all. In proof of this I need only refer to the particular adaptability of the Ontario apple as seen in Trenton, the Blenheim at Burlington, the Cranberry at Grimsby, the Baldwin in Essex, and the Duchess in Simcoe and the North. There are, of course, some varieties which have a much wider range than others, but to meet the demand for the best quality we must ascertain as definitely as possible the particular varieties best adapted to each section.



View in M. Pettit's Vineyard, Winona. Grape rows half a mile long. | —

The question as to how long it is advisable to continue testing varieties which show no particular signs of promise is one we should come to some definite conclusion upon and advise our experimenters accordingly. For instance, at our gooseberry station at Nantýr, it has now been pretty well settled by five or six years' repeated tests that the English varieties of gooseberries, which are so much prized wherever they can be grown free from mildew, are almost a complete failure there, notwithstanding all Mr. Spillett's efforts to keep them free of mildew.

Would it not now be advisable to try a few of the leading English and American varieties at some of the other stations where the conditions are quite different, as at Burlington, Walkerton, and St. Joseph Island?

In Mr. Pettit's experimental vineyard at Winona, where over a hundred new varieties of grapes have been under test for several years, it is quite evident that very few of these much-lauded new kinds are worthy of further trial there or anywhere else in Ontario. It would be as well now to root out these worthless kinds to make room for more extensive planting of those kinds which have proved their value, and for other new ones which should be given a trial.

The excellent results which have been obtained with various kinds of fruits at the Algoma Station on St. Joseph Island have been a surprise to many. At that particular point the soil is very fertile, the atmosphere quite humid, and the rainfall frequent, all of which contribute to make this the "Emerald Isle of the North." The strawberry finds there the ideal conditions for growth, and because of the few grown it is a most profitable crop. From a little patch of about a quarter of an acre Mr. Young cleared this year about \$200. The berries were so large that eighteen filled a box, and they all sold for 10c per box right in his own village.

The cherries were an abundant crop. Most of the apple trees also were heavily loaded, and some of the plums are quite promising. So far the codling moth and plum curculio have not yet made their appearance on the island.

The surprising results already obtained at this station tend to show what can be grown in sections of Algoma and Muskoka wherever the local conditions are favorable. There are, however, many sections in that northern country where the climatic conditions are not nearly so favorable as on St. Joseph's Island, and for this reason I think it would be advisable to establish another station where further tests could be made under more trying conditions. A station in the Temiskaming District, where so many new settlers are now going in, would probably afford the other extreme, and if started at once would no doubt prove a great saving of time, money and effort to the people of that rapidly growing section.



Agawam and Eldorado Blackberries as grown at G. C. Caston's, Craighurst, Ont.

FRUIT CONDITIONS IN NEW ONTARIO.

At a meeting of the Board of Control, held at the Industrial Fair grounds on Wednesday, September 9th, 1903, it was agreed that it is desirable that a fruit testing station be opened in the district above North Bay, possibly at New Liskeard, and

it was ordered that the Secretary of the Board, Mr. L. Woolverton, and the Secretary of the Ontario Fruit Growers' Association, Mr. G. C. Creelman, be a committee to investigate the whole question.

Subsequently it was decided to send Mr. Harold Jones of Maitland, to this northern country to examine fruit conditions there and report to this Board. The following is his report:

Maitland, Sept. 30th, 1903.

To the Board of Control. Gentlemen:

Following instructions from the Board of Control of the Fruit Experiment Stations to study the conditions and possibilities of fruit growing in New Ontario, with the object in view of establishing an experiment station in that section, I arrived at North Bay on September 21st. The next morning I went directly north for a distance of 28 miles, on the Government railroad, now being constructed.

Beyond the first two or three miles north of North Bay, the road passes through an unbroken forest of Spruce, Balsam, Cedar, Pine, Birch, Maple, and a little Basswood.

On this railway, at Trout Lake, Sturgeon River, and on the south side of Moose Lake, wild plums grow successfully, also pin-cherries, chokecherries, raspberries, blueberries, gooseberries, elderberries, strawberries, and high bush cranberries.



Chas. Young's experimental apple orchard at Richard's Landing, St. Joseph's Island, Algoma.

The land varies greatly, from rocky ridges (granite) to sand, gravelly loam and clay loam. The most of this section, as far as soil conditions are concerned, will undoubtedly be adapted to fruit growing when the forest is cleared away.

This section of the country is at a high elevation. Sturgeon Lake, about 25 miles north of North Bay, is about 1,200 feet above sea level, and 600 feet above North Bay.

I understand that portions of this forest I have just mentioned are reserved by the Government as a timber reserve, and so will not be open to settlement for some time.

On September 22nd I took the train to Mattawa, a point on the Ottawa River, east of North Bay. From there I went by rail 39 miles up the banks of the Ottawa, to the foot of Lake Temiskaming, from which point I went to New Liskeard, a distance of 85 miles, on one of the Lumsden Company's steamers.

The banks of the Ottawa and of Lake Temiskaming, as seen from the train and steamer, are abrupt cliffs, mostly of a rocky formation, covered with Soft Maple, Silver Birch, Poplar, Balsam, Spruce, and Pine, with some Burr Oak. These cliffs are rich in scenic grandeur, but very little, if any, fit for cultivation.

At Haileybury, six miles south of New Liskeard, the rocky formation abruptly stops, and we enter into the great clay belt of the north, which is said to be 600 miles long, of about 200 miles wide, and of unknown depth.

I stopped over night at New Liskeard, a thriving little town of 1,000 or 1,200 inhabitants, who have great expectations.

The next morning, September 24th, I drove out on the East Road, along the north end of the lake, for a distance of six miles. I found the land here all clay, with the exception of two limestone ridges.



Northern Spy Tree at W. H. Dempsey's, Trenton.

My first stop was at S. S. Ritchie's, five miles east of Liskeard, whose land is on the banks of the lake. This farm is a rather high elevation above the lake, and upon examining the soil in a cellar, that had been dug for a dwelling, I found it sandy for a few inches, with a clay to gravelly sub-soil, which would give good natural drainage. At this place I found a Hyslop Crab, and what was evidently a Duchess about four years old, in a healthy, thriving condition. The natural forest on this farm is deep-rooted, and there was no evidence of root-killing, even in varieties of apples that he had planted that were not hardy in wood and branch in that northern country.

I also visited C. W. Tucker, adjoining Ritchie, with soil conditions similar to those just mentioned. Here I found a Hyslop Crab, a good-sized apple of Russian origin bearing fruit, and Concord and Niagara grapes. Concord were ripe, Niagara green. I also found two native plums of excellent quality in full bearing.

I returned to New Liskeard for dinner, and after dinner drove towards White River and Tomstown, on what is known as the North Road. With the exception of two ravines, this country is a flat bed of solid clay, covered with a forest of small growth of Spruce, Balsam, and Celar. The clay is covered to a depth of from three to ten inches with muck and decaying vegetable matter. The forest is growing with its root system spread out in this surface soil, and when the roots are turned the clay is left beneath as smooth as a slate.

Ten miles north I visited a gardener, by the name of Mackewen. I found him with a very good showing in potatoes, roots and grain, but he had not attempted any trees. I examined his well, and found the water level only 17 inches below the surface, which condition is very general along this road.

The next morning I drove out on the West Road to Milberta, a distance of 13 miles from New Liskeard, passing through the same clay, with the exception of one limestone ridge. On this road, however, I found more ravines, which gave better facilities for draining. I walked down one ravine about one hundred feet deep, with a small creek in the bottom, and looked in the riffles in the creek bottom for evidences of sand, and found none. The banks were the same fine clay all the way down. There are no trees planted by the settlers in this section, with the exception of a few on two farms set out this spring.



Orchard and home of J. G. Mitchell, Clarksburg.

A man named Doughty, on the road to Spring Lake from the West Road to Liskeard, had two McIntosh apple trees root-killed last winter. His soil is sand from eight inches to a foot, sub-soil, clay. Tetofsky blossomed and bore fruit. McIntosh blossomed and died in July.

John Martin, nine miles on the West Road, has planted apple and cherry trees, but his land is such that the trees will have no chance to make a root system.

Frank Atkinson, Milberta P.O., has a high location between two ravines. Conditions are favorable here for success with artificial drainage.

S. B. Bisby (postoffice New Liskeard), Henwood Township, 22 miles northwest of New Liskeard, who has a high location, soil a little sand, over loamy clay, no heavy clay down for two feet, has some birch, deep rooted. Possibly this land will give good natural drainage, and Bisby is an enthusiast, and feels sure that he can succeed with fruit.

On the Haileybury Road, south from New Liskeard, on the lake shore, a man by the name of Hawksworth has some apple and plum trees, and had one Wealthy in bearing.

Weather conditions seem favorable for the growing of all kinds of crops, and there is no evidence of severe frosts up to this date, corn being still green in most sections. In the winter months the thermometer falls as low as 40 degrees below zero, with the usual snowfall of about 2 1-2 feet, the ground often freezing to a depth of 2 feet. This country is evidently north of the belt of heavy snowfalls, such as they have along the north shore of lakes Superior and Huron.



Picking Cuthbert Raspberries at A. E. Sherrington's, Walkerton, Ont.

Taking into consideration the limited amount of clearing done, I think the wisest course your Board can adopt is to start a system of co-operative experiments in fruit, sending a few trees of varieties, hardy at Ottawa, to the men I have mentioned above, with instructions as to the planting and care, asking them to report results from year to year to the Board. Then in two or three years' time, if the Board sees fit to send their representative again to the country, he will be able to judge intelligently as to the best locality for an experiment station, and also as to the fitness of the man for the work who may be chosen as experimenter.

All of which I humbly submit.

Harold Jones.

INDUSTRIAL FAIR.

The usual large and instructive exhibit of fruit was made at the Industrial Fair during the past season. Each experimenter set up his own exhibit, but the whole was under the charge of Mr. W. M. Orr, of Fruitland; while Mr. A. M. Smith, an honorary director of the Ontario Fruit Growers' Association, and one of our best pomologists, was engaged to identify varieties and discard those which were incorrectly named.

Mr. Smith reported as follows:

R. L. Huggard, Whitby: 67 plates apples, 61 plates pears, 10 plates plums, 1 plate peaches; total 139. Many inferior samples, and 9 or 10 wrongly named.

Harold Jones, Maitland: 47 varieties of apples and crabs, 7 varieties of pears. A good many poor varieties shown.

W. H. Dempsey, Trenton : 153 varieties of apples : mostly good samples, and good varieties, and true to name.

M. Pettit, Winona : 66 varieties of grapes ; mostly good samples, all true to name.

A. E. Sherrington, Walkerton : 66 varieties of apples and plums ; true to name, and mostly good samples.

W. W. Hilborn, Leamington : 6 varieties of plums, 26 of peaches, 40 plates in all ; some duplicates.

John S. Mitchell, Clarksburg : 110 varieties of plums and apples, some of them duplicates ; 120 plates in all. Kinds true to name.

A. M. Smith.

At a meeting of the Board of Control, held on the Fair grounds on the 9th of September,, 1903, it was resolved that in future the experimental exhibit from each station be subdivided into at least two classes : (1) Those desirable for planting in the section represented, and (2) those proved to be undesirable ; and that these two divisions be plainly labelled.

At the same meeting of the Board it was ordered that Messrs. Creelman, Orr and Hutt be a committee from this Board to advise with the committee from the Ontario Fruit Growers' Association, with regard to a special building for the use of the experiment stations ; (1) for demonstrations in horticultural methods ; (2) for an educational exhibit of varieties, and (3) for lectures on horticultural topics.

Ordered that this Board advise a continuous exhibit of fruit from the stations, providing proper installation, can be obtained, and that provision be made for demonstrations in packing and in other horticultural methods.

Also ordered that a limited number of glass jars be provided for preserving tender fruits for this exhibition.

GENERAL NOTES BY EXPERIMENTERS.

G. C. Caston (Simcoe Station).

This season has been a favorable one for nearly all kinds of fruits, the exceptions here being cherries and plums, and to some extent strawberries, which were injured in the early part of the season by dry weather. Raspberries did fairly well, and blackberries bore an abundant crop.

Early apples, such as Duchess, were not as good as last year, this being their off year ; fall apples were plentiful, and of first-rate quality. Winter apples were a good crop, and of better quality than usual. The fungus scab was conspicuous by its absence this year. Nearly all apples, with the exception of Snows, which were slightly affected, were clean and bright. Even in orchards where no spraying is ever attempted, the fruit this year was clean. I attribute this to the dry, cool weather that prevailed through the early part of the summer. And just here a question arises that is often discussed, viz., What weather conditions are the most conducive to the propagation and spread of the fuscladium, or fungus scab ? Different opinions are held as to this matter, as also with reference to the rust on wheat, which is a fungus of a similar nature. In my opinion precisely the same conditions apply to both, viz., the presence of excessive moisture and heat, without wind or any air currents. We find that trees that are well pruned, far apart, and more especially on rolling land, bear the cleanest fruit, which goes to prove the truth of this assertion ; also the opposite conditions prevailing this year resulting in a clean, bright crop of apples. All this seems to me conclusive proof that my opinion is correct. And the lesson to be learned is that to have the finest apples, we must plant trees farther apart, and on rolling land, if possible. Also that we must prune regularly, and spray early and persistently, keeping the surface of bark and leaves and fruit covered with Bordeaux mixture until the danger is past. Thus we may secure fruit of good quality in an unfavorable season.

A much larger percentage of apples were of higher grade than perhaps ever before, but great difficulty was experienced in getting a supply of barrels and these were sold at famine prices, which becomes a serious charge in the way of expenses, and reducing the net price of the fruit considerably.

This year goes to show that the question of fruit packages is a live one, and the fruit growers are—to use a common phrase—up against it. It was a fine year for spraying, there being no rains to interfere, and although unsprayed orchards apparently had as clean fruit as those that were sprayed, yet the check trees in my own orchard showed a very decided difference. We must continue to spray if we are to have good fruit. A season like this comes but seldom. The old favorite, the Northern Spy, fairly excelled itself this year in this section. Wherever there was a Spy tree it was loaded with fruit, and the quality was first-class. We can never have too many Spys. They are all wanted, and more than we can supply.

A. W. Peart (Burlington Station).

The fruit crop here has been heavy. Quality, too, has been above the average. Insects and fungi were not so troublesome as usual. The season has been somewhat peculiar—a 'dry, warm May, followed by a cool, damp summer, and an autumn of high temperature, with little moisture. The general result was large fruit, and a good growth of wood. The wood of vines, bushes, and trees appears to be going into winter well ripened.

Apples probably gave as heavy a yield as in 1902. The quality, however, was better—fewer worms and less spot. It is difficult to account for the comparative absence of worms. Perhaps the presence of more parasitic insects, the more general use of burlap bands, and the heavy crop for two years in succession—all these may have been contributing factors in breaking the heart of the Codling moth; and while the summer conditions were rather favorable to the development of apple spot, those of the fall were contrary. A fungous parasite friendly to the apple grower appears to have worked silently, covering many of the black spots with bronze-like formations, thus destroying their growth, and rendering them harmless. This was very noticeable in the Greening, Baldwin, and King. It seemed, however, to have little affinity for the Snow, as it is as spotted as usual. Owing to the difficulty in securing barrels, boxes have been used much more freely than in past years.

The best commercial varieties for this district appear to be the Duchess, Ribston; Blenheim, King, Greening, Baldwin, and Spy.

Pears, with the exception of the Anjou and Sheldon, were a good crop, of fine quality. Their size was exceptional; the Bartlett, Flemish Beauty, Easter Beurre, Josephine, and Winter Nelis, being especially large and handsome. The Duchess was slightly spotted. Winter Nelis, Josephine, Easter Beurre, and Wilder are promising. For commercial planting, Clapp's Favorite, Bartlett, Duchess, and Anjou take the lead.

Plums were a heavy crop. The curculio did little damage, but there was considerable rot in some varieties. Of the domestic kinds, Lombard, Quackenbos, Bradshaw, Niagara and Reine Claude are the most grown; while the Abundance, Burbank, and Satsuma stand at the head of the Japans. The plum acreage, however, appears to be too wide for present conditions, the crop being handled this year with little, if any, profit.

Peaches were also a good crop. There was little or no leaf curl. The varieties chiefly grown are the Champion, Crosby, Elberta, Early and Late Crawford, Smock and Tyhurst.

Cherries were only a moderate crop. Trees have made a good growth, the season being much more favorable than last year, when several young Montmorencys suddenly blighted and died during July. Early Richmond, Montmorency, English Morello, May Duke, and Windsor are the most largely grown.

Grapes were a fair crop, of excellent quality. All varieties carried their leaves well save the Agawam and Wilder. There was no mildew of any account. Owing to some occult cause the Brightons set but very little fruit. All varieties ripened well, even the Catawba, which is tardy some seasons. Prices were good. Taking one year with another, it is doubtful whether any fruit pays better than the grape. The more profitable varieties grown here are the Worden and Concord for black, the Niagara and Moore's Diamond for white, and for red the Delaware and Lindley. In a general way grapes require more severe pruning than they generally get. I use a mixed system, that is, the spur and renewal combined, which insures fine fruit, and also saves a lot of time in tying. Wherever it is possible I get rid of an old branch and train up a new one to take its place. I also spur the young laterals of the older branches to one or two buds.

Raspberries were a fair crop. The slug did little or no damage. The leading varieties here are: red, Marlboro and Miller for early; Cuthbert and Loudon for late varieties; black, Kansas, Older, and Smith's Giant; white, the Golden Queen.

The Harris raspberry, planted in 1901, does not promise well. It lacks vigor and growthiness.

John G. Mitchell (Georgian Bay Station).

The past season, as regards weather, has been one which leaves little to be desired. Winter was unusually steady and mild; the thermometer only occasionally going below zero, and the coldest about ten degrees below. Spring opened fine and bright, but not too warm—just what is wanted in this section to hold back the buds until all danger of frost is past. Not a twig or bud seemed to burst. But, notwithstanding the fact that everything seemed just right, we have had a very light crop of cherries and apples, caused, doubtless, by the superabundance of moisture of the previous season, which, I think, predisposed the trees to take on wood growth rather than fruit, as they have made a great growth of wood this summer. However, the fruit was very large and fine, and filled many more barrels than we expected.

We practice clean cultivation until about the middle of July or first of August, when orchards are sown to red or crimson clover, which gave us a heavy stand this spring. There are few more beautiful sights than an orchard covered with crimson clover, with all its varying shades. It is a delight for the artistic eye. We plow it in at blossoming time, and also apply all the stable manure and other manure we can spare or readily secure.

From experience and observation I have come to the conclusion that trees must be fed a balanced ration, the same as an animal. Ninety per cent. of the total success depends on cultivation and feed.

A. E. Sherrington (Lake Huron Station).

The season just closing has been a fairly satisfactory one as to quantity and quality of fruit. The winter of 1902-3 was, on the whole, a model one, the lowest temperature being 13 degrees below zero; but even at that temperature the peach buds, and even some of the trees, were killed. This was owing, no doubt to the condition the trees were in at the time. The spring opened up very early, with summer-like weather in the month of March, which brought vegetation on, only to be injured later by frost. On May the 1st there were twelve degrees of frost. Currants and gooseberries were in full bloom. Currants and cherries suffered the worst, black currants being a total failure. Two varieties of pears were sent by the Department, for planting at this station the past spring, the experimenter adding four varieties of plums. All of the stock is doing very well. All small fruits, with the exception of currants, were a splendid crop, especially the raspberries, which were exceedingly fine. Cherries were very light, with the exception of English Morello and Ostheim, and, as usual the birds took the bulk of the crop. Plums were a fair crop, and of good quality. Pears were

good, and a number of the trees in the experimental plots commenced to bear this season.

Apples were a very good crop, and of fair quality. The most of this crop in this section was handled by the Lake Huron Fruit Growers' Association, and shipped under the co-operative system, fourteen carloads being shipped in this way. Fungus was not so prevalent as last year, but better spraying must be done if we wish to produce No. 1 fruit; more power will have to be used, and more attention paid to the spraying of the tops of the trees. Insects were not numerous this season, with the exception of the black and green aphids, which attacked the cherry, plum, and apple trees in large numbers. To control those pests, our plums and cherries were sprayed twice with whale oil soap.

Chas. Young (Algoma Station).

The past season has been a peculiar one here in Algoma in many respects—cold and wet, so much so since early summer that the use of the cultivator was impossible for weeks at a time; nevertheless we have had a very good crop of fruit, especially of fall and early winter varieties, and the trees have ripened up their new wood well. I have noticed among those who do not spray more scab than formerly, which perhaps, may be accounted for by the moist weather during the growing season. The only insect pest which has caused any trouble was the aphid on the apple, and it was a struggle between them and the grower which would win. When taken in time, I did not find much difficulty, but with those who only have a few trees they were apt to be overlooked, when the job of getting clear of them was much more difficult.

At the fall show of the Western Agricultural Society, held in the Town of Sault Ste. Marie, the more prominent fruit growers in Algoma seem by instinct to have met for several years past to compare notes and exhibit new varieties. Something like 30 different varieties were shown in collections by each exhibitor. I am aware that this is not quite in accordance with the required rule as laid down for exhibitors, but so far it has served our purpose well and given many of us an opportunity of seeing samples of which we only had heard the names of before. Of fall apples, we had plenty to choose from. The same may be said of early winter varieties. What we wanted, and what we have long been trying to get, is an apple of first-class quality that would keep into spring. Spys, Kings, and Baldwins we cannot for some reason or other grow, and although all these have been top grafted on hardy stock, I have never heard of an apple being produced. Last year, however, indeed, for several years, I have had some very good Wageners, and last year some excellent specimens of Ontario have been shown. Should these varieties succeed further back from the influence of the lake, we have probably got just what we have been looking for. Why these have produced such fine fruit when Spys have been so unsuccessful I cannot say, for I have always considered Ontario and Spy as belonging to the same family. Mann also, an apple which I have always considered not quite hardy, was on exhibition. Indeed, from present experience, it may just be possible that the fruit belt, like the wheat belt, is moving westward.

I am very much pleased to notice that there is a probability of a fruit station for the Temiskaming district. This is just as it ought to be, for there is a vast field for experimental work north and west of the Georgian Bay, and if there had been any reliable information for this District of Algoma twenty years ago, it would have saved the settlers many thousands of dollars, and we would not have such statements made as "I planted an orchard of Greenings eighteen years ago and never got an apple." Last summer I made inquiry of a man who had planted quite extensively two years before and reported failure. I asked him what kinds he had planted. He said, all Baldwins. The agent recommended them as being the biggest-priced apples in England, and backed up his recommendation with a clipping from some horticultural journal that it was a mistake to plant many varieties.

I do not know that we have many members of the Fruit Growers' Association in Temiskaming, but a few ideas gathered from experience and observation may not be out of place to the new settlers. First, do not wait for any experiment station; begin right now. Avoid low, flat, heavy clay if possible, but if suitable soil near the house cannot be had, ridge up the land 30 feet wide and plant 25 feet apart on the ridge. Do not plant deep; there is no danger of root-freezing in Temiskaming, as the snow falls early and deep. Second, shelter is desirable, but not absolutely necessary; a free circulation of air is better than a closely confined orchard. Third, give clean cultivation for three or four years by growing roots. There is no need for any cover crop; the snow is better than anything you can grow; in fact, I have seen it a harbor for field mice in winter. Fourth, give protection to the trunks of the young trees by wrapping with a piece of building paper, a barrel stave, or a strip of bark on the south side to prevent sunscald in the spring. Fifth, have three limbs branching out about four feet from the ground. Any lower than this the tops are liable to broken by the weight of soft snow in the spring, while high trunks are more likely to suffer from sunscald. Plant Duchess, Longfield, and Wealthy; these will give you fruit from 1st September to 1st March in the north. For anything further, wait for results from your nearest station. If success is assured, make a personal visit to your station; it is far more satisfactory than any amount of writing to those who contemplate planting. All small fruit will grow there, many of them better than in the old townships of Ontario, except blackberries and grapes. Do not bother with them; they will not succeed. Do not cover your strawberries before winter sets in, or possibly you may find them partly smothered in the spring. This is not in accordance with the advice of horticultural journals, but our conditions are different. Finally, plant a few trees, make a resolution to give each of them at least as much attention as you would a hill of potatoes.

Harold Jones (St. Lawrence Station).

The season just past has been one of the most favorable for the production of a perfect crop of apples that we have had in years.

From early April to June 16th we had not a drop of rain, and during that time it was cool, but no frosts in May. The trees blossomed in weather of perfect sunshine, and fertilization of the blossoms was perfect. All trees that blossomed set a full crop, and all so perfect and healthy that there was very little June dropping. On June 16th we had a heavy rain set in that lasted two days and a night, and about 4 inches of water fell, that was taken up by the soil as though it was a sponge; and following this rain we had more or less continual showers all summer until the middle of November.

Orchards were singularly free of all insect pests, and fungi hardly made an appearance.

Fameuse and kindred varieties that usually spot badly, where not sprayed, came through perfectly clean, even where not sprayed at all. This season's observations on the development of "spots" helps to impress upon all earnest thinkers the necessity of early and frequent sprayings in years of normal rainfall. Through April, May, and the first half of June, there was no moisture to develop fungi, but from June 16th to late fall, conditions were very favorable for its growth. Still, the fruit remained clean. For some years I have found that trees that I sprayed every week or ten days from the 1st of May to the middle of June, and then stopped, were cleaner than those only sprayed two or three times before that date, but continued into August. Further work and thought along this line will likely demonstrate to a certainty that if the spot is kept under absolute control for the first month and a half of the growing season the crop is practically safe.

The experimental orchard was under clean cultivation, with a cover crop of clover plowed down in the plum and pear blocks; in the apples a cover crop was plowed down, barnyard manure applied, and planted to corn.

All the apple trees have done well, and made good growth, except Blenheim Orange. This tree was injured by the winter, all the limbs dying, but they sent out a new growth of suckers, which are going into winter in a green, sappy state, and will probably be dead in the spring.

The European and Japanese plums are showing further weakness and unsuitability for this section, which shows that we must look to the American type for thrifty and hardy trees that will blossom and bear fruit.

In pears many of the standards for Western Ontario are proving tender here, but Flemish Beauty, Clapp, Ribston, and Keiffer are varieties that will succeed and give us fruit of good quality.

W. W. Hilborn (Southwestern Station).

The season has been on the whole a favorable one for the fruit grower. Peaches were rather above an average crop, and on account of plenty of rain the fruit was larger than usual. Fruit rot was quite prevalent at several periods during the ripening season on account of an excess of rain.

This disease caused more injury than it has done previously for many years. Orchards that were not sprayed lost a large part of their foliage; quite a number of trees died from this cause. Spraying to be effectual must be done early in spring. The earlier the better, and certainly must be done before the buds start, otherwise but poor or indifferent results will be obtained. Lime, salt and sulphur, or Bordeaux mixture will control this disease if properly done at the right time.

Plums were the most abundant crop ever known in this locality. Reasonable prices were obtained for the first early varieties; of these the Japans took the lead; Red June, Satsuma, Abundance, and Burbank were most profitable of the older or well tested kinds.

Cherries are coming into more prominence as a market fruit, and the supply at present does not equal the demand. The great drawback in cherry culture is the difficulty in getting the fruit picked on account of the scarcity of suitable help, and also on account of fruit rot, which often destroys a large portion of most of the sweet varieties. Among the most profitable sorts in my orchard are the following: Windsor, Smith's Biggarreau, Yellow Spanish, Napoleon, and Gov. Wood, of the sweet cherries; Early Richmond, and Montmorency, of the sour or Morello type.

While pruning last spring, I discovered San Jose scale in two of the experimental blocks. The first was on Japan plum trees, the second on a peach tree. The scale was very numerous on two trees in each locality. In the plum block quite a large number of trees contained more or less scale. The trees in both cases were six or seven years planted. When I discovered the scale, my first impulse was to take out and burn all infested trees and those in their immediate vicinity. This would, however, have destroyed quite a number of valuable trees, some of which could not be replaced. As it was early in the season, and no danger of the scale spreading for some weeks, I concluded that before pulling the trees out, I would wait a few days for more mature judgment. In the meantime I wrote Prof. Lochhead at the O.A.C., Guelph, who advised me to spray with lime and sulphur mixture. The usual method of boiling this mixture for four hours in a kettle deterred me from making it that way for want of time for the operation. I succeeded, however, in getting a small steam boiler (a kind made in Leamington for steaming hog feed), which answered the purpose admirably. This, with two coal oil barrels, one for heating water in, the other for boiling the mixture, makes a very satisfactory outfit with which to manufacture the lime, salt and sulphur preparation. The formula I use is 15 pounds lime, 15 pounds sulphur, and 10 pounds salt. In making I proceed about as follows: Fill one barrel with water, turn in the steam until hot; then turn the steam into barrel No. 2, in which four or five pails of water have been placed. When this has been heated nearly to the boiling point put in 15 pounds good, fresh, lump stone lime, stir constantly while slaking to pre-

vent lime from burning. As soon as the slaking has advanced sufficiently to admit, add 15 pounds sulphur by rubbing through a sieve made of door screen wire netting. Stir constantly while adding the sulphur. It is well at this time to add four or five more pails of hot water from barrel No. 1. Boil one hour, then add 10 pounds salt, and boil 15 minutes longer, when it is ready to put into the spraying barrel. It must be put through a strainer. I use a short linen sack, stretched over a form made of wood or wire to hold the mouth of the bag open. As soon as the mixture is cooked turn the steam into barrel No. 1, and heat the water as nearly to the boiling point as possible while the mixture is being strained. They add sufficient water (as hot as possible) to fill the spray barrel, and proceed to use it at once. If left to get cold it is not effectual. With my two boys I made and applied 16 barrels in three days. The result has been that at this writing (November 10th), after diligent search, I have not been able to find one living scale in my orchard.

I have heard and seen so much about the destructive powers of the San Jose scale that when I first discovered it in my orchard I must confess that I was afraid it was the beginning of the end of fruit growing for profit with me. I can now state, however, that the scale does not give one an anxious thought. I am not sure but there is some truth in the statement made by a noted American fruit grower, "that the San Jose scale was like weeds—a blessing in disguise." The trees that were thoroughly sprayed with this mixture have been more healthy and less injured by insect enemies and fungous diseases. I am convinced from this one season's trial that it will pay well to give an annual spraying with this mixture, even where there is no scale, for the general cleaning up it gives the trees.

A. E. Annis (Wabigoon Station).

	Vigor.	Hardness.	Productiveness.		Vigor.	Hardness.	Productiveness.
GOOSEBERRIES.				RASPBERRIES.			
Downing.....	4	4	4	Older.....	2	2	2
Pearl.....	2	2	2	Columbian.....	2	6	2
Red Jacket.....	4	4	4	Cuthbert.....	2	7	7
CURRANTS.				Miller.....	2	6	6
Cherry.....	8	8	9	Louden.....	2	6	4
Fay's.....	6	8	6	Marlboro.....	2	7	7
Saunders.....	9	10	9	STRAWBERRIES.			
Lee's.....	9	10	9	Clyde.....	2	5	7
White Grape.....	9	8	10	Williams.....	2	6	2

This climate, I think, is too severe for apples (standard). I have a number of trees now about 4 1-2 feet high, grown from seed, which are alive to the top bud year after year. I have three crabs, but they have not fruited yet; some of their branches kill back in the winter.

One Ostheim cherry is making very slow growth; it kills back almost to the main trunk every winter.

NOTES ON APPLES.

G. C. Caston (Simcoe Station).

There was added only one variety to the list this year, "Wisner's Dessert," said to be an excellent dessert apple. Of the new varieties fruiting there were one or two Russians, early varieties, of such a short season and poor quality as to be not worth any description. In speaking of the Russian apples, I might make one

exception among the varieties. It is one that was sent here from the Experimental Farm, Ottawa, before I began experimental work at all. It was sent under the name of Lode, though Prof. Macoun thinks it is not the proper name for it. It is an excellent dessert apple, of about the same season as the Duchess of Oldenburg, and the tree is very hardy, healthy and vigorous. In fact, those Russians, so far as my experience of them goes, are only to be recommended for northern sections, where only the most hardy varieties will succeed. Their hardiness is their principal merit, and I certainly would not recommend any of them for this locality, where we can grow so many better varieties. Their principal use here would be as stock for top grafting upon, and even for that purpose I would much prefer the Talman Sweet.

Of the other new varieties fruited two are worthy of special mention, which I think will, on further acquaintance, prove worthy of recommendation :

Dominie. A large green apple, over three inches in diameter, with a brownish red tinge on one side. In shape like the Blenheim Pippin, with a short, thick stem, set in a wide, moderately deep cavity, and a large, open calyx in a wide, deep basin. As only one specimen was grown, it has not been tested as to quality of flesh, or flavor, but is evidently a long keeper. It is clean, and apparently not likely to be affected by scab.

North-West Greening. This is a green apple of large size, conical in shape, medium stem, set in a narrow, deep cavity ; calyx closed in a very small, shallow basin ; skin green, turning to a yellowish tinge at maturity, showing on one side very minute brown dots. It is evidently a good keeper, being at this time hard in texture, flesh yellow, crisp, juicy, with a pleasant, aromatic flavor.

North Star. A large, green fall apple, coarse flesh, but of fairly good flavor. In the presence of so many better ones of the same season, I would not recommend it. We have too many of its class now for the good of the trade.

Hamilton. A handsome, clean-skinned apple, of rich yellow color when ripe, but a short keeper ; inclined to water core ; not recommended for general planting.

Montreal Peach. A large, yellow fall apple, with nothing particular to recommend it.

Windsor Chief. A fine-looking, hard winter apple, evidently a long keeper ; above medium size, dark red in color, and in shape somewhat resembling the Baldwin ; a promising variety, but as the tree only bore one specimen, it will be necessary to wait until it bears a crop before recommending it.

Cooper's Market. This variety is famous as a long keeping variety. The trees here are just beginning to bear, and it certainly is a hard, firm apple. Very conical in shape ; stem medium, set in a deep, narrow cavity ; calyx closed in a very small, shallow basin ; skin green, overspread with dark red, somewhat streaked ; flesh firm, juicy, rather acid ; flavor will no doubt improve toward spring ; season from October to May.

Salome. A bright red, handsome apple, of medium size ; conical shape. A late, long keeper, of fair quality. Tree healthy and hardy.

Winter Maiden's Blush. This variety has fruited two years, and, as it seems to show good qualities, it may be safe to recommend it. It will be a good shipper and keeper here. The apple is large, much larger than the fall variety of that name, and of a different shape, being quite conical and somewhat ribbed, with a very short, thick stem, set in a wide shallow cavity ; calyx open and small, in a very small, shallow, plaited basin ; skin green, turning to yellow at maturity, showing minute green dots, and overspread on one side with pale red, lacking the bright, handsome coloring of the fall variety ; flesh white, crisp, juicy, acid ; a good cooker ; season probably from October to February.

Peter. This variety, sent out some years ago under this name, is, in my opinion, simply the Wealthy under another name. We have far too many of that sort in this country now, and it would be a difficult task for a nursery agent to sell Wealthy trees to any experienced grower here.

McIntosh Red. This variety has excelled itself this year, being free from scab, and nearly twice as large as usual. If it can be kept free from scab by persistent spraying it will no doubt prove a profitable variety to grow as a dessert apple, and will take the place of the Snow, which is not entirely satisfactory here. The Snow, when large and clean, is a very salable apple, but so few people spray their orchards that it is only in years like the present that it is marketable condition. The trees are also inclined to overbear, and then the fruit is too small. One way of overcoming this difficulty is by severe pruning, and if ever a variety calls for a thorough pruning and spraying that variety is the Snow.

Ontario. This apple has been in bearing for three years, both top grafted and on the nursery tree, and I have no hesitation in recommending it as a valuable addition to the commercial list for the district. Though in point of quality it does not come up to the Spy, yet its fine size, clean skin, productiveness, and early bearing commend it as a valuable variety.

Baxter. There is nothing new about this variety, except that this year it has suddenly become famous by making a record price for itself in the British market, the highest probably ever recorded for a Canadian apple. It is not a big yielder, but bears pretty regular crops, and, like the Snow, is very susceptible to the attack of scab. It requires strong, rich soil, and does best on high table land or land that is rolling, and should be thoroughly sprayed. It has the peculiar habit of bearing its fruit on the ends of the small twigs, and is more liable to damage from high winds on that account when fruit is near maturity. The flesh is coarse, but withal has a rather pleasant flavor when ripe, and is a splendid cooker. But its large size, and bright, handsome color is what makes it a good seller, when free from scab, as it is this year.

Gano. This variety still maintains its good reputation here as a profitable apple. Two trees, planted in 1895, bore two barrels each of first-class apples this year. I consider it in all respects superior to the Ben Davis.

Shackleford. A green winter apple, has born a few specimens for the last two or three years, but unless it shows evidence of bearing better qualities as it grows older it will scarcely find a place in the recommended list.

The Secretary.

Hubbardston. On the model prize list which has been issued by the Association of Fairs, in their first annual report, we note the name of Hubbardston, a variety of apple which is less known and less cultivated in Ontario than its merits deserve. It is really one of our best early winter apples, being higher colored than King and more productive than Ribston.

In those sections where it has been found to succeed, this apple should rank high for planting in the commercial orchard, but we hear so little about it at our meetings, and so seldom see it at our fairs, that we conclude it has not been tried in many parts of our Province. Some years ago we received some samples from a subscriber at Beamsville, which were very fine and beautifully colored, and the grower said he counted them among his most valuable market apples. Mr. A. A. Wright, M.P., of Renfrew, speaks most highly of the apple for a retail trade, and says that it is the favorite variety called for by his customers.

The Hubbardston originated in Hubbardston, Mass., whence, of course, it takes its name. The following notes on this apple from various fruit growers will be of interest:

E. Morris, Fonthill: The Hubbardstone apple is not grown extensively in this section, just a few odd trees. The apple as grown here is a very productive one, and of good quality, but ripens a little too early for profitable shipping.

A. E. Sherrington, Walkerton: The Hubbardston does well here with Mr. Shaw. The tree is a vigorous grower and an annual bearer, and the fruit does not spot. I think it would be profitable.

A. M. Smith, St. Catharines: Hubbardston Nonsuch is not much grown in this section, but among our packers it is highly esteemed. Titterington & Co. say it is one of the best of the late fall for market. I have never fruited it myself. Some have confounded it with the Blenheim Pippin, which it somewhat resembles, but is smaller in size and a little better keeper, being classed by Downing as an early winter.

Ben Davis. Mr. Dempsey says: It always pays me well, but it has its own season in the market, and that is toward spring, after the Baldwin and Spy have been well cleared out. Nobody wants to eat a Ben Davis in fall or early winter; it is not ready so early. My own family use more Ben Davis than Baldwin, because in Baldwin season they prefer to use Spy; but when these are over, say in April, then they call for Ben Davis, and by that time it is good for all purposes.

"I have great confidence in Ben Davis for top grafting upon," says Mr. Shourds of Wellington, Prince Edward County. "A Spy tree is apt to split at the crotch, but Ben Davis is tough and does not break down; besides Spy, top grafted on Ben Davis, bears fairly early. I have an instance where I top grafted Spy on the branches of a Ben Davis at three years after planting, and at seven years it began fruiting. I am planting twenty acres to Ben Davis trees, and if I want Spy I will have first-class stock upon which to top graft it."

Phoenix. This is grown to a considerable extent in Northumberland County, and some growers value it highly. Mr. Solomon, of Brighton, a packer at Butler's storage, said he found it quite as productive as Baldwin, as good a shipper and seller; but Mr. C. W. Crandall, of Colborne, thought it inferior to Baldwin, and all owned it was not as good a keeper, and should be shipped before January or it would discolor. The samples given us on January 20th, however, were still bright in color and in excellent condition.

Stark. In response to our inquiries regarding the behavior of the Stark apple in Ontario, we have received the following:

W. H. Dempsey, Trenton, Ont.: The tree has made very rapid growth; the foliage is large, dark green in color, and somewhat subject to fungus; very productive every alternate year; the fruit is large, clean, dull in color, and not so attractive in appearance as many other varieties, and it is a first-class commercial apple only for this fault. In some localities it has been shipped under the name of Baldwin.

Sam Nesbitt, Brighton, Ont.: In respect to the Stark apple I have always found it to be an exceedingly good shipper for export, as it apparently stood the passage over better than most any other apple in the months of February and March. There was one other point in its favor, and that is that it never discolored. Whether this will hold good after it has been as long a time as the Baldwins is a question that only the future will decide. The tree is a most prolific bearer, and the only objection that I have to the apples (and the same thing applies to buyers in the United Kingdom) is the fact that they are not the right shade of red, making it difficult for the people who sell fancy apples to polish them and make the display that is necessary to catch the eye of the consumer.

Harold Jones, Maitland: In this section, where Spys and Baldwins cannot be successfully grown, the Stark has come to stay. It is perfectly hardy and a heavy bearer. The fruit keeps well into April. The color is a little dull, but the size and other good qualities mentioned places it near the top of the list as a desirable winter apple for the St. Lawrence valley.

When attending the Fruit Institute meetings last winter I included Stark in a short list of best winters for planting in the commercial orchard.

Red Astrachan. This was introduced into England from Sweden in 1816, and since the Early Harvest has become so badly affected with scab, the Astrachan has been largely planted in Ontario as an early summer apple. The tree grows to be a large size, and is very productive; one at Maplehurst, forty years planted, gave a yield of ten barrels in 1895, which is not unusual, so that when prices are good this apple is very remunerative. The quality is only fair, and very tart; but the large size of the

fruit, and its deep crimson color, often covered with a thin whitish bloom, makes it very salable.

During the last four years New York State and Ontario have been producing this apple in such quantity that after the first two or three pickings the price has been very low, and we have been compelled to seek for a distant market. The apple is so tender that it is impossible to land it in the British markets in good condition except by cold storage, held at a temperature of about 33 degrees F., a condition which it has hitherto been difficult to ensure.

King. The King is one of the favorite varieties in the market, but unfortunately it is so shy a bearer on its own roots that it is not very profitable. It has, however, frequently been noted that by top-grafting it on any vigorous stock it becomes much more prolific.

The Fruit Division, Ottawa, invited correspondence upon this subject, and has received some valuable information. Mr. C. L. Stephens, of Orillia, has the King top-grafted on Duchess, and finds that its bearing qualities are quite satisfactory. Mr. Wm. Read of Jarrat's Corners, has twelve King trees grafted on Duchess, and reports equally good results. Mr. Judson Harris, of Ingersoll, has an orchard of two and a half acres, the crop from which the past eight years has never brought him less than \$500. Many of these trees are Kings grafted on Russets. Mr. Robert Murray of Avening, has a number of King trees on their own roots and others grafted on Talman Sweet's, and notes that the top-grafted trees are the only ones that give him paying crops.

The experience of these growers and many others goes to show that it would be a very profitable business to top-graft at least some of the early apples to be found all over Ontario with Kings. The King is an apple that exactly fills the bill as a fancy market variety, as it is of excellent quality, color and size, and well known in the English market. If its only defect, want of productiveness, can be cured by the simple method of top-grafting, it should prove a boon to many people who have vigorous trees of undesirable varieties.

John G. Mitchell (Georgian Bay Station).

In apples the well-tried old varieties still hold the lead. For export we find Baldwin, Greening, Ben Davis, Spy, and King the most profitable. The latter variety seems to require top-grafting on to some hardy stock, such as Talman or Russet. I know a great many King trees good bearers grafted on these stocks. The only new variety which seems worthy of planting largely here is Ontario. The more experience I have with it, the more I am impressed with it and the better I like it. It is large and showy, a good keeper; not as good quality as Spy, but a good apple if kept till maturity; a fairly good grower, and an early and abundant bearer. Several young trees six years old in a neighbor's orchard produced a barrel each of fine clean fruit this fall.

R. L. Huggard (East Central Station).

We have no trees injured by last winter; all came out in leaf, and later in full bloom, except Baldwin, King, and Pewaukee, most of which had no bloom. Greening, Canada Red, Ben Davis, Mann, Baxter, and several others had light bloom; while Spy, Minkler, Salome, Boston Star, Stark, all the Russians, Astrachan, Duchess and many others, were well loaded with blossoms and fruit. Of the newest varieties, Stark yielded the largest quantity, nearly 4 bushels per tree, Gideon, Northern Beauty coming next, with over 3 bushels per tree; Duchess and Transparent, about 2½ bushels per tree. Wolf River and Alexander were about equal, 1½ bushels per tree each; McIntosh Red is not a success, as the fruit is so deformed, not over 30 per cent, being uniform and perfect. Winter Maiden Blush was fine, large, and handsome; Russets are very fine, clean, and large. Pippins were large and clean, but a light crop; and Salome was well laden with beautiful fruit.

Varieties that promised to be productive, judging by yield in 1903 :
 Yellow Transparent, Duchess, Fameuse, Wealthy (or Gideon, or Western Beauty).
 For export : Stark, Salome, Shackelford, Wolf River, Bismark.

Charles Young (Algoma Station).

In making my report for 1903, I may begin by stating that there are now some 60 or 65 varieties of apples under test here, all of which are healthy and making satisfactory growth. With a few exceptions, all of those planted in 1899, have fruited this year. Sweet Bough is the only one not able to withstand the climate. A special selection of hardy varieties only were at first started with me; later some new, untested varieties have been added. I have top-grafted on old stock almost everything I have seen recommended. Two of the later planted, viz., Pewaukee and Ontario, planted three years ago, did not leaf until the middle of July, and have this year made a fine growth. I have also several varieties of Russian apples, now generally propagated, large, handsome fruit, but all fall apples, and with nothing much to recommend them. Two of the best are Basil the Great, and Orel. Among those that so far have not been satisfactory here I may mention Ben Davis. The color, which goes a long way in selling it in other localities, is wanting when grown here; I might call it a dirty brown, and it looks unmaturing. Scott's Winter, often recommended for the north, unless under very high cultivation is too small; it takes too many to fill a barrel, although the keeping qualities are all right; it will not be a profitable apple to grow. For a sweet apple Talman is all right, the trunk is freer from sunscald than any other, not excepting the Duchess, which so far has been the money-maker. We cannot begin to supply the local demand at 25 cents a 10-quart basket.

A. E. Sherrington (Lake Huron Station).

Barry : A small, worthless apple, will top-graft in the spring.

Bismarck : A medium to large apple; color, skin yellow; nearly covered with a rich red; quality fair, subject to scab.

Gano : Nothing but a Ben Davis with me.

Peter : Resembles the Wealthy very much; early and annual bearer; about the size and quality of the Wealthy.

Salome : Tree a fine grower, but fruit small to medium; rather uneven in size; needs further trial.

Wine Sap : A very nice apple, but too small to be profitable.

Harold Jones, (St. Lawrence Station).

Chenango Strawberry : A healthy and hardy tree; moderately vigorous; bears in from three to four years from planting. Fruit medium-sized, oblong, conical; an attractive-looking apple, and good quality for dessert; season September, but will keep in fair condition in cold storage until December.

Gideon : A healthy, vigorous, hardy tree, comes into bearing two or three years after planting. Fruit 2 1/2 to 2 3/4, conical; skin waxy white, blushed with pink; a handsome apple, of good quality for cooking in its season; season September and first half of October, after which date it shows decay at the core, and is utterly worthless long before it shows any defects at the surface; growing in disfavor among buyers, and not desirable to plant in large numbers.

Longfield : A very hardy, vigorous tree, of drooping habit; commences to bear fruit in two years after planting, and trees of five years of age will produce heavy crops. Fruit medium to small; shows finger marks and bruises, and is hard to handle for packing; season September, October. This would be very desirable for planting one or two trees in a garden for home use, but is useless as a commercial apple. This tree has been largely advertised by nurserymen, and sales pushed by travelling agents. So

there is, no doubt, a large number of these trees just coming into bearing, which will be a disappointment to the owners, as they were sold in many cases as winter apples. However, they have got a capital stock for top working, and can easily change the head to some desirable and profitable variety.

Ontario: I have looked upon this as a very promising apple, one that would take the place of the Spy, but the tree is proving not healthy, subject to canker in the trunk, and will be short lived; it bears in three or four years after planting; fruit resembles the Spy in appearance, but is not so good in quality.

Salome: A hardy, healthy tree, with a close, round head; vigorous grower. The trees I have planted are on clay loam, and the fruit is absolutely worthless, not much larger than good crabs, and does not reach maturity; third year of fruiting. Good reports are received on this apple from the counties in the vicinity of Toronto, but I have never seen a good specimen in the St. Lawrence counties yet.

Blenheim Orange. Proving tender in this section, and cannot be recommended for planting.

Peter: In every way seems identical with Wealthy; an early and heavy bearer, of medium to large, handsome fruit; desirable for planting, as it is a good commercial apple, and ships well to the European market.

Pewaukee: A hardy and vigorous tree; an early and heavy bearer; fruit of fair to good quality, both for cooking and dessert; does not show up well in the package on account of its peculiar formation and dull colorings, but is a good February apple, and commands fair prices. Its chief fault is dropping before maturity, which is a very serious one in a winter apple.

Setton Beauty: A slow, weak grower with me, and is not proving hardy.

Milwaukee: A strong, vigorous grower, very hardy; very much the character of the Duchess in growth; needs very little trimming, and is a business tree, commencing to bear in two or three years after planting, and gives good crops of fruit of large size, 3 to 3 1-2 inches across the core; rather coarse in flesh, but brisk acid, and a good cooker; a good February apple. I have kept it in good condition till April. This tree would pay well planted close, say, 15 x 25 feet, and thinned out as they get age, leaving them 25 x 30 feet, as they come into bearing early, and make fruit rather than wood as they get age; a valuable addition to our small list of good winter apples.

North-West Greening: A vigorous, hardy tree, forming a close, round head, requiring rather severe pruning; an early bearer and a heavy cropper; fruit of large size; greenish yellow, sometimes with a dash of pink on the sunny side; quality not equal to Rhode Island Greening, but more attractive in appearance; season winter; desirable.

Switzer: A hardy, vigorous, spreading tree; fruit of medium size; skin white, almost covered with bright red; flesh tender, juicy, melting; ripe in August and first week in September; drops as soon as ripe; not valuable for general planting.

Shackleford: A hardy, spreading, moderately vigorous tree; an early bearer and heavy cropper; fruit of good quality, but unattractive in appearance; skin greasy, which gives the fruit a soiled appearance when handled.

Canada Baldwin: A very hardy, vigorous tree; comes into bearing slowly, six or seven years after planting; gives promise of being a valuable apple.

A. W. Peart (Burlington Station).

Of the 39 varieties of Southern State apples top grafted on Roxbury Russet trees in 1901, 7 have borne fruit this year:

Hanseley's Winesap: 15 apples, mottled red; small to medium, conic, round; stem medium length; very few spots; basin shallow, moderate.

Highfield: 1 apple, medium, roundish flat, red spotted.

Ozark: 3 apples, medium dark, handsome, roundish flat, badly spotted.

Rebel : 4 apples, large red, handsome, roundish flat, no spots ; the most promising so far of the lot.

Red Belleflower : 1 apple, small, oblong, conical, dark red, spotted.

Wandering Spy : 2 apples, medium to large, roundish flat, red, some spots.

All of the above appear to be late varieties, as they are now (November 10th) quite firm.

The seven varieties of Southern apple trees, as well as the dwarfs, Alexander and McIntosh, and the standard Bismarck, have grown well.

Stanley Spillet, Nantyr, Ont.

My Princess Louise, obtained from the Association, gave two barrels of magnificent fruit. Scores of people have sampled it, and all declare it to be away ahead of Snow in size, color, flavor, and freedom from scab. Grafts from the tree are in demand here.

W. H. Dempsey (Bay of Quinte).

Downing's Winter Maiden's Blush (Syn. of Greenville) : Planted in 1896 ; seems to be very backward about fruiting, only a few apples on the trees, while the ones top grafted were well loaded with fine, large, handsome apples ; fruit hung well to the trees until November 1st ; quite free from apple scab, although on the same tree with Winter Fameuse, which always has more or less scab on it.

Western Beauty : Planted 1896, and Peter, planted 1897 (which are both identical with Wealthy), bore 3 bushels to the tree of fine, large, highly-colored apples, of which 90 per cent. were No. 1.

Wallbridge : Planted in 1896 ; fruited this year for the first time, four bushels ; 40 per cent. No. 1 ; very uneven in size ; tree good grower.

Longfield : Planted in 1895 ; has been fruiting more or less since '98 ; sets more apples than it can carry to a marketable size ; therefore of no value unless very carefully thinned ; ripens in September ; fruit very tender, showing the least mark in handling.

Beauty of Bath : Planted in 1896 ; not very productive, 1 peck to the tree ; fruit handsome in appearance, but flesh very dry and mealy ; season, August ; not worth growing in this district.

Sutton Beauty : Planted in 1896 ; has been slow in coming into bearing, only a few samples each year.

Barry : Planted 1896 ; bore a few apples of no value for anything.

Starr : Planted 1896, from Wm. Perry ; 3 trees, which bore a few small, worthless apples, not of the same form as produced by scions received from the same source at the same time, which are of large size, very similar to Primate, and of the same season ; valuable to the amateur grower as an early apple.

Milding : Planted in 1897, making a good growth ; bore a few fine specimens this year.

Newtown Pippin : Planted 1897 ; trees have made medium growth ; bore two apples this year.

Dudley's Winter : Planted in 1896 ; fruiting three years ; September and October apple, of no particular value.

Gano : Planted in 1898, commenced fruiting the second year after planting ; bore one-half bushel this year of handsome red apples, very similar to Ben Davis in every respect, only a little darker in color.

Shackleford : Planted 1896 ; bore three pecks of fair-sized apples ; very similar in coloring to Spy.

Many of the varieties which were top grafted on bearing trees, bore heavily this year, of which the Windsor Chief (which bore very heavily for the amount of top), Downing's Maiden Blush, Boiken, Winter Banana and Roman Beauty are among the most promising of the winter varieties. The worst pests we had to contend with this year were green aphids and pear-tree psylla.

NOTES ON BLACKBERRIES.

A. W. Peart (Burlington Station).

Blackberries were an exceptionally heavy crop. Owing to the continued warm, dry weather during May they began to blossom about a week earlier than usual. The cool weather, however, of June and July delayed their ripening beyond the normal period. Occasional showers during August prolonged their season, and prevented many of some varieties from drying on the bushes. In the new plantation, let out in 1901, all varieties thus far, appear hardy. This plot will serve not only as a double test, but also as a check on the old plantation, and will, we hope, help us to dig up wider and deeper facts in relation to the different varieties. The weather conditions have been favorable to a very good growth, yet the dry fall promises well-ripened canes. They have been very free from insect and fungous diseases.

The following varieties are considered too unproductive for this section: Maxwell, Childs' Tree, Dorchester, El Dorado, Wachusetts, Wilson's Junior, Ancient Briton, Early Cluster, and Minnewaski. Lovett's Best, Gainor, Early King, Humbolt, and Wilson's Early deserve further trial.

These appear to be the most desirable for a commercial plantation: Agawam, Kittatinny, Erie, Ohmer, Snyder, Taylor, and Western Triumph. Should the Early Harvest prove hardy, it would be a desirable acquisition, on account of its earliness. Varieties which bear heavy loads should be pruned severely.

Agawam: Cane dark red, vigorous, upright grower, hardy, and productive; berry roundish oblong, medium size 7-8 x 3-4 inches, sweet, but rather insipid;— season medium, July 25-August 20; a good commercial variety; resists drouth very well.

Ancient Briton: Cane dull red, moderately vigorous, upright, not productive; berry oblong, conical, medium, 7-8 x 3-4 inch, of good flavor; season medium, July 25-August 20.

Dorchester: Cane brownish red, vigorous, upright, spreading, hardy, but a poor cropper; berry large to very large, 1 1-8 x 3-4 inch, roundish, oblong, firm, of fine quality; season medium, July 25-August 20.

Early Cluster: Cane dull red, vigorous, upright, spreading, not productive; berry roundish, oblong, medium, 7-8 x 3-4 inch, sweet, of good quality; season early to medium, July 20-August 20.

Early Harvest: Cane greenish, medium, vigorous, stiff and upright, retains foliage late in season, very productive, and requires close pruning; berry medium to large, 1 x 3-4 inch, oblong, conical, of fair quality; season early, July 15-August 5; hardy thus far in new plantation.

Early King: Cane dull red, moderately vigorous, upright, spreading, productive; berry small to medium; 3-4 x 5-8 inch, roundish, oblong, of excellent quality; season early to medium, July 18-August 10.

El Dorado: Cane brownish red, upright, spreading, medium vigor, hardy, not very productive; berry medium to large, 1 x 3-4 inch, oblong, conical, sprightly, of excellent quality; season medium, July 25-August 20.

Erie: Cane greenish red, moderate vigor, spreading, retains leaves late, hardy and productive; berry of good quality; medium, 7-8 x 3-4, roundish, conical; season medium, July 25-August 20.

Gainor: Cane reddish green, very strong, spreading grower, retains foliage late, hardy and productive; berry very large, 1 1-4 x 7-8, roundish, oblong, of fine quality; season medium, July 25-August 20; promising.

Humboldt: Cane reddish green, upright, hardy, of moderate vigor; a new bush, not sufficiently established to report upon fruit.

Kittatinny: Cane dark red, with greenish patches, very vigorous, upright, spreading, late foliage, hardy, moderately productive, will stand long pruning, very

resistive of drouth ; berry large to very large, 1 1-8 x 3-4 inch, oblong-ovate, sub-acid, rich and juicy ; season late, July 30-August 30 ; one of the best.

Lovett's Best : Cane dark red, a strong, very stiff, upright grower, hardy and productive ; berry oblong-round, medium, 7-8 x 3-4 inch, of fair quality ; season late, July 30-August 30.

Maxwell : Cane reddish green, retains leaves late ; very weak, light grower, very spreading, hardy, poor cropper ; berry oblong-round, large to very large, 1 1-8 x 3-4 inch, of excellent quality ; season medium, July 25-August 20.

Minnewaski : Cane reddish green, retains leaves late, strong, upright, spreading, not productive ; berry medium, 7-8 x 3-4 inch, roundish-oblong, of good quality ; season early to medium, July 20-August 15.

Ohmer : Cane reddish green, vigorous, spreading, retains leaves late, hardy and productive ; berry very large, 1 1-4 x 7-8 inch, coreless, oblong-oval, of good quality ; season medium, July 25-August 20.

Snyder : Cane dark red, strong, upright, hardy and very productive ; berry medium, 7-8 x 3-4 inch, oblong-oval, of fair quality ; season early to medium, July 20-August 15 ; requires a rich soil, with damp sub-soil, very close pruning ; a good market variety.

Stone's Hardy : Cane brownish red, strong, upright, hardy and productive ; berry oblong-oval, somewhat soft, small to medium, 3-4 x 5-8 inch, of good quality ; season medium, July 25-August 20 ; rather small for profit.

Taylor : Cane reddish green, medium vigor, upright, spreading, hardy and productive ; berry medium, 7-8 x 3-4 inch, oblong-oval, rich, of good quality ; season medium to late, July 25-August 25 ; a good commercial variety.

Wachusett : Cane dull red, medium vigor, upright, hardy, not productive ; very few thorns ; berry of fine quality, medium size, 7-8 x 3-4 inch ; oblong-round ; season July 25-August 25.

Western Triumph : Cane dull red, strong, upright, hardy and very productive ; berry medium, 7-8 x 3-4, oblong-round, of good quality ; season medium, July 25-August 20 ; like the Snyder, it requires a damp bottom and close pruning.

Wilson's Early : Cane dark red, strong, upright, spreading, hardy and fairly productive ; berry large, 1 x 3-4, oblong-round, sprightly, rich, of good quality ; season medium, July 25-August 20.

Wilson's Junior : Cane reddish green, moderately strong grower, very spreading, vine-like, trailing, hardy and not productive ; propagates by tips or suckers ; berry medium, 7-8 x 3-4, oblong-oval, sweet ; season medium, July 25-August 20 ; without use to the commercial grower.

Charles Young (Algoma Station).

The hardiest that I have tested are the El Dorado and Agawam, but the amount of fruit obtained is so small that they are not worth growing. Blackcap raspberries are nearly as bad, besides no one cares for them, preferring the red and white raspberries, which have done very well. Loudon, on account of its extra hardiness, I prefer to any others I have tried, but it is a poor berry when compared with Brinckle's Orange for the table.

G. C. Caston, Craighurst (Simcoe Station).

Agawam and El Dorado are the two varieties for this section, and they have given excellent results. They have borne excellent crops of fine fruit every year, so that in my experience they are by far the most profitable of the small fruits grown here. I tested some 16 varieties before I got the right ones for this section, and I can confidently recommend these two.

Nursery agents have been selling blackberry plants through this section for years, but none of them ever seemed to succeed, for the simple reason that they were not

suit to the locality. Now, since I have succeeded in producing large crops of these berries, there is a great demand for plants of these two varieties, and yet there are people who say that a fruit experiment station is of no use.

NOTES ON CHERRIES.

L. Woolverton (Maplehurst Fruit Farm).

On the whole, the season has been an encouraging one for cherry growers, for although some varieties of sweet cherries have given a short crop, there has been an abundant yield of sour kinds, and the price of these has been unusually high.

Yields. The following varieties have given a very poor yield during the past season, viz., Black Tartarian (almost a total failure), Elkhorn (rotted), Windsor (rotted). A very good crop was harvested from Knight's Early, Rockport, Wood, Cleveland, Napoleon, Montmorency, May Duke, California Advance, Olivet, Purity, and Reine Hortense.

Growth. The growth of the trees throughout the whole of the cherry plot has been unusually rapid up to August 15th, the best, indeed, that we have observed for years, due to such favoring conditions as abundant summer rains, thorough cultivation, freedom of the trees from the aphis, which some seasons is so abundant that the trees are much stunted thereby.

The Season. The first cherries of the season were Early Purple, of which the first picking was on the 12th of June; the last cherries of the season were English Morello, gathered on the 22nd of July, so that the whole cherry season lasted nearly six weeks. It is evident that by a judicious planting of varieties one might continue regular shipments of cherries to the markets during the whole of this period, and that the amateur could so select for his garden that his fruit dish could be constantly supplied during the whole cherry season.

The Rot. This fungus is the most serious obstacle in the way of the cherry grower, more especially of the Bigarreaus, which are especially subject. During the past season it has proved very disastrous, especially toward the end of June, on account of favoring climatic conditions. Rains were frequent, keeping the trees almost constantly wet, while at the same time there was much heat. On one occasion a heavy rain was immediately succeeded by a hot sun, and the rot spread with great rapidity among the Tartarians and Napoleons. One variety, however, seemed to be almost proof against rot, viz., the Knight's Early Black, a remarkable good cherry, and one which is most regular in its bearing habits, and of which the fruit seems never to need culling.

Insect enemies have been very few during the past season. The curculio was bad in the Belle Magnifique, which was almost worthless on this account, as, indeed, it has been for two years previous, but other varieties were remarkably free and perfect. The aphis did not show itself at all until the fruiting season was over, owing, no doubt, to careful spraying with whale oil soap, 20 pounds to the barrel. The kind used was sent us as a sample from New York City. This was more effective than the crude petroleum used in 1902 and much safer. In 1902 we used the latter, applying it very carefully with a fine spray. It did not entirely rout the aphis, and some injury to the trees was traceable to it.

Report on Varieties Fruiting, 1903. Trees 7 to 8 Years of Age, Unless Otherwise Specified.

Early Purple: Gathered June 12th; yield 15 qts. An enormous crop was set, and the trees were black with fruit, but the birds were most destructive, taking a great part of the fruit. The ten pound basket of these cherries sold for 60 cents each.

May Duke: Gathered June 17th; yield 21 qts.; ripened prettily and evenly, but birds took nearly one-third of the fruit.

Governor Wood : Gathered June 22nd; yield 5 qts.; from small sized tree ; crop not heavy, about two-thirds; some rot; sold for about 60 cents per 9-qt. basket.

Cleveland : Gathered June 22nd, yield 5 qts.; no rot; more highly colored, a little sweeter, and a trifle softer than Governor Woods, in our opinion superior ; an early and abundant bearer.

Rockport : Gathered June 23rd; yield of tree 40 years old, 65 qts.; usually badly affected with rot, but this year quite free, perhaps due to spraying with Bordeaux.

Ohio : Gathered June 23rd; yield 6 qts.; no rot; same season as Elton, smaller but superior.

Elton : Gathered June 23rd; yield 5 qts.; half rotted; birds took a large part.

Knight : Gathered June 25th; yield of tree 40 years old, 198 qts.; one of the best this season of all varieties; always profitable; a regular and abundant bearer; the fruit not subject to birds, rot, or Curculio.

Tartarian : Gathered June 26th ; yield 3 qts.; a failure this season owing to rot and birds, giving less than one-quarter of a crop ; the poorest cropper of all this season.

Reine Hortense : Gathered July 1st; yield 17 qts.; a fine crop of larger cherries than usual; in great demand about home, so many want it for domestic use, whether for canning, for pies, or, when dead ripe, excellent for eating with cream and sugar.

Royal Duke : Gathered July 2nd ; yield 10 qts.; did not ripen evenly, and consequently it was necessary to make two pickings, at the second of which those left from the first were wonderfully improved ; still, this uneven ripening is a serious objection in the commercial orchard.

Napoleon : Gathered July 23rd ; yield of a 30-year-old tree, 135 quarts ; fruit rotted very badly, fully two-thirds of the cherries being worthless; otherwise a large, fine cherry.

Empress Eugenie : Gathered July 4th; yield 18 qts.; a heavy crop of fine fruit, not subject to rot or to birds, and consequently valuable for the commercial orchard.

Olivet : Gathered July 4th; yield 17 qts.; usually rather a shy bearer, but quite productive this season ; a favorite canning cherry.

Orel, No. 28 : Gathered July 5th ; yield 5 qts.; tree an early and abundant bearer, but a slow grower.

Black Eagle : Gathered July 5th; usually a very shy bearer, and therefore scarcely worth gathering, but this year it yielded about quarter of a full crop. The fruit was very fine and sold in the orchard at 75 cents for a nine-quart basket.

Yellow Spanish : Gathered July 6th; yield 3 qts.; a fair quality for the variety, for the cherries are usually thin on the trees, though the individual samples are very fine.

Early Richmond : Gathered July 6th; yield very good, but not equal to Montmorency, because cherry is smaller ; tree not as vigorous as Montmorency, and needs good care and cultivation.

Purity : Gathered July 6th ; yield 7 qts. from tree about four years planted. A fine cherry though a little softer than Montmorency ; a good, regular bearer, and very promising.

Straus Weichsel : Gathered July 7th ; yield 3 qts.; not productive enough to be profitable; fruits singly.

Red May : Gathered July 8th; yield 2 qts.; a promising variety, but rather small.

Black Knight : Gathered July 8th; yield 1 pt.; an improved Mazzard; a young tree, and its first crop.

King's Amarelle : Gathered July 8th ; yield 9 qts. off five-year-old tree; a fine late Kentish cherry, but not so rich a red as Montmorency ; very productive; one of the finest of its class.

Downer's Red Lane : Gathered July 9th ; yield 7 qts. off a tree nine years old. Does not fruit in clusters, and therefore not as productive as some varieties.

Lutovka : Gathered July 15th; yield 5 qts.; one of the finest, largest, and richest colored of all the sour cherries ; the fruit reminds one of red plums ; flesh firm, and the variety is, therefore, a good shipper.

Montmorency Ordinaire : Same as Montmorency.

Montmorency : Gathered July 16th; yield 36 qts. from an eight year old tree. The best of all the sour cherries for the commercial orchard; color fine rich red. This season we had the finest crop of this cherry we ever had, the cherries were so large, and the trees were just red with the fruit, presenting a beautiful sight. These cherries sold unusually high this season.

Ostheim : Gathered July 7th; yield 18 qts. from a six year old tree; color too dark a red to sell at best prices.

English Morello : Gathered July 21st; yield 37 qts.; very productive, but did not take in the market as well as Montmorency; the dark red does not seem so attractive as the bright red to buyers of pie cherries.

California Advance : The finest Duke cherry in our collection at Maplehurst; the samples this year were very fine. The tree has proved an excellent bearer, beginning to crop after two years planting, and has not failed to produce a crop every year since.

G. C. Caston (Simcoe Fruit Station).

Of some forty varieties tested here, the one that stands pre-eminent so far is the Orel 24. It is a dark red cherry, nearly black when ripe; of fairly good size; of better quality than Ostheim, which it resembles in color; and a splendid canning variety. Most of the varieties under test did well, and appeared healthy for the past few years. But now many of them show signs of failure. Last year, as described in my report, a peculiar blight, or sporadic fungus, attacked the cherries, causing the leaves to turn yellow and fall off. Several trees died from the effects of this. Those were English Morello and Wragg, which is the Morello under another name. The other affected trees have recovered under a vigorous treatment with Bordeaux mixture, and have now apparently regained their normal condition; but they bore no fruit this year. The ones least affected, or immune from this attack, were Orel 24, which bore a crop this year; Ostheim, which also fruited a light crop; Bessarabian, Griotte du Nord, Brusseler Braun, and Litham.

Orel 24 is the one most highly recommended. It is one of the first planted in the experimental plot, in 1894, and, though not a vigorous grower, it remains sound and healthy, is not as liable to black knot as many of the others, and the fruit is better in quality than any I have yet tasted. The Montmorency is yet to be tried, being only planted this year. There is a rather difficult investigation required in the case of the different varieties of cherries here, and that is to what degree of temperature the fruit buds of each variety will stand without injury.

Charles Young (Algoma Fruit Station).

Cherries have been very satisfactory, except sweet cherries, of which I have only two Early Purple and one Yellow Spanish. The first is healthy, apparently, but no fruit yet; of the latter, the tree is tender, and this winter will, I think, finish it. It may be possible to find something among the Dukes to take their place. In the meantime sweet cherries are not a success here. Sour cherries, 12 varieties by name, although I cannot distinguish that many by the fruit, have done extra well, planted in 1890 and later; they have had full crops this year. The three best are: E. Richmond, Montmorency, and English Morello. These are given in their order of ripening, and it takes them all to lengthen out the season. It is between Montmorency and Morello, which is most productive. I prefer the former, as the fruit is larger. Ostheim I cannot find a place for; it is a half dwarf, a shy bearer, and I see nothing to recommend it, unless it is to eat out of hand when fully ripe. It is then the nearest approach to a sweet cherry that I know of.

Harold Jones (St. Lawrence Station).

May Duke : A vigorous, upright grower, planted in 1897. Fruit buds tender ; practically all of them being destroyed every year ; useless for this section.

Montmorency : Planted in 1897 ; a very vigorous, spreading, handsome tree ; fruit buds somewhat injured every year, but the tree produces a scattered crop of excellent fruit. If the fruit buds do not show better resistance as the tree attains age, it will have to be classed with varieties "not hardy" in this section.

Reine Hortense : Planted 1897 ; a vigorous, upright grower ; fruit buds tender ; not hardy.

Ostheim : Planted in 1897 ; a vigorous, spreading grower, inclined to droop ; wood and fruit buds hardy ; not a very heavy yielder, but moderate crops of fine fruit ; a good cherry for pies and canning ; desirable for this section, in fact, can be classed as very desirable.

Orel : Planted 1897 ; a moderately vigorous, spreading to drooping grower ; very hardy in wood and fruit bud ; has regularly borne crops since 1900 of medium to large sized fruit ; bright red ; very handsome ; a first-rate canning and pie cherry. The best all round cherry yet tested.

Olivet : Planted 1897 ; a vigorous, upright to spreading grower, resembling Montmorency somewhat ; not hardy in fruit bud ; not desirable for this section.

Early Richmond and English Morello : Hardy in wood and bud for this section, and yield good crops, but are not as desirable as Orel and Ostheim when planted on clay soils ; on sandy loams they are desirable varieties.

Select List of Cherries for Market.

Prepared by Mr. L. Woolverton.

Black Tartarian, Cleveland, Early Richmond, Elkhorn, English Morello, Governor Wood, Knight's Early Black, Late Duke, May Duke, Montmorency, Napoleon, Reine Hortense, Windsor.

CURRENTS.

A. W. Peart (Burlington Station).

Currents were a good crop, the black varieties doing especially well. No disease nor insect cut any particular figure, save the currant worm, which is always with us, but which is easily controlled by timely spraying. Blooming was about a week earlier than usual, while picking, owing to the cool summer weather, was somewhat later. The leaf blight, which last year affected such varieties as the North Star and White Imperial, did little damage this season.

These appear to be the best varieties for the planter : Red—Wilder, Cherry, Pomona, Red Victoria, Prince Albert, and North Star ; black—Saunders, Naples, and Collins' Prolific ; white—the Grape for yield, and the Imperial for quality.

We are disposed to omit the following from a commercial list : Belle de St. Giles, Raby Castle, Red Dutch, Versailles, and Champion. The first and last varieties are not sufficiently productive, while the other three are too small.

All the described varieties have reached bearing age.

Belle de St. Giles : Bush, weak, spreading ; hardy, but not productive ; leaves dark green ; bunch long, compact ; berry dark red, acid, large to very large, 1-2 to 5-8 inch, of fair quality ; season, medium, July 10th to August 5th ; large and showy, but a very poor cropper ; yield per bush, 1903, 2 lbs.

Black Victoria : Bush, weak, spreading, hardy and productive ; leaves, dark green ; berry large, 1-2 inch, firm, sweet, of excellent quality ; season, medium, July 15th to August 10th ; yield, 6 lbs.

Brayley's Seedling : Bush of moderate vigor, upright, spreading, hardy and fairly productive; leaves, light green; bunch of medium length, loose and straggling; berry, dark red, medium size, 3-8 inch, very acid, sprightly flavor; season, medium, July 10th to August 15th; yield, 5 lbs.

Champion : Origin, England; bush, upright, vigorous, hardy, and moderately productive; leaves dark green; berry very large, 5-8 inch, black, sub-acid; season, late, July 25th to August 15th. Like Collins' Prolific, is a valuable cropper from year to year; yield, 5 lbs.

Cherry : Origin, Europe; bush, upright-spreading, vigorous, hardy, and very productive; leaves, dark green; bunch, short and compact; berry, dark, red, large, 1-2 inch, acid; season medium, July 10th to August 5th. Still a standard commercial currant; yield, 7 lbs.

Collins' Prolific : Bush very vigorous, upright, hardy, variable in yield; leaves, dark green; berry black, large to very large, 1-2 to 5-8 inch; sweet, sub-acid and firm; season, medium to late, July 20th to August 10th; yield 7 lbs.

Crandall : Bush, upright-spreading, very strong, vigorous, rampant, hardy, and moderately productive; leaves, very light green; bunch, short, compact; berry, variable in size 3-8 to 3-4 inch, bluish-black, thick skin, sweet, sub-acid; ripens unevenly, some of the later berries hanging until frost; season, July 20th to October; yield, 6 lbs. Said to be excellent for canning.

Fay's Prolific : Origin, New York; probably a cross between Cherry and Victoria; bush of moderate vigor, spreading, hardy, and fairly productive; leaves, dark green; bunch, long and loose; berry, large to very large, 1-2 to 5-8 inch, red, firm, and sub-acid; season, medium, July 10th to August 5th; yield, 5 lbs.

Lee's Prolific : Origin, England; bush spreading, moderately vigorous, hardy and moderately productive; berry, black, large to very large, 1-2 to 5-8 inch, sub-acid; season, medium, July 15th to August 10th. This currant, like Fay's Prolific, requires careful cultivation; yield, 4½ lbs.

Naples : Origin, Europe; bush, upright-spreading, hardy, and very productive; leaves, dark green; berry, large, 1-2 inch, black, sub-acid; season medium, July 15th to August 10th. An old, reliable kind; yield, 5 1-2 lbs.

New Victoria : Bush spreading, very vigorous, hardy, and productive; leaves, green; bunch, long and loose; berry, red, small to medium, 3-8 inch, sub-acid, agreeable; season, medium, July 10th to August 5th; yield, 7 lbs.

North Star : Origin, Minnesota; bush strong, upright, hardy, and productive; leaves green; bunch, medium long, compact; berry red, medium to large, 3-8 to 1-2 inch, acid, sprightly; season, medium to late, July 15th to August 10th; a good late variety; yield, 7 lbs.

Pomona : Bush, medium vigor, upright, spreading, hardy and productive; leaves, dark green; bunch, long and compact; berry, medium to large, 3-8 to 1-2 inch, sub-acid, of fine quality; season, medium, July 10th to August 5th; very promising; yield, 5 lbs.

Prince Albert : Bush, strong, spreading, hardy, and productive; leaves, dark green, large, and deeply serrated; bunch, short to medium; berry, small to medium, 3-8 inch, light red, very acid; season, late, July 15th to September 1st; yield, 6 lbs.

Raby Castle : Origin, Canada; bush, upright, very vigorous, hardy, and very productive; leaves, light green; bunch, short, compact; berry, light red, small to medium; 3-8 inch, firm, acid; season, medium, July 10th to August 5th; yield 7 1-2 lbs.

Red Cross : Origin, New York; likely a cross between Cherry and White Grape; bush, spreading, vigorous, hardy and productive; leaves, green; bunch, short and compact; berry red, medium to large, 3-8 to 1-2 inch, firm, sprightly, sub acid; season, medium, July 15th to August 10th; yield, 6 lbs.

Red Dutch : Origin, Europe; bush, spreading, moderately vigorous, hardy and very productive; leaves, normal green; bunch, medium length, loose; berry, red, small,

1-3 to 3-8 inch, acid, of fine flavor ; season, early to medium, July 10th to August 5th ; yield, 9 lbs.

Red Victoria : Bush, upright-spreading, very vigorous, hardy and very productive ; leaves, light green ; bunch, long and loose ; berry, medium to large, 3-8 to 1-2 inch, red, tenacious, firm and acid ; season, medium, July 10th to August 5th ; a good commercial variety ; yield, 9 lbs.

Saunders : Origin, Ontario ; bush, vigorous, upright-spreading, hardy and productive ; berry, black, large, 1-2 inch, sub-acid to sweet, fine flavor ; season, medium, July 15th to August 10th ; yield, 6 lbs. ; an excellent variety.

Versailles : Origin, France ; bush, of medium vigor, upright grower, hardy, and moderately productive ; leaves, dark green ; bunch, medium length, rather compact ; berry, red, medium, 3-8 inch, acid ; season, early to medium, July 10th to August 5th ; yield, 5 lbs.

White Grape : Origin, Europe ; bush, strong, upright-spreading, hardy, and productive ; leaves, green ; bunch, long and loose ; berry, white, large, 1-2 inch, sub-acid, pleasant flavor ; season, medium to late, July 15th to August 10th ; yield, 7 lbs.

White Imperial : Bush moderately strong, upright-spreading ; leaves, green ; bunch, long and loose ; berry, white, medium to large, 3-8 to 1-2 inch, very sweet, fine quality ; season, medium, July 10th to August 5th ; yield, 5 lbs.

Wilder : Origin, New York ; bush, strong, upright grower, hardy, healthy, and productive ; leaves, dark green ; bunch, medium length, compact ; berry, red, tenacious, medium to large, 3-8 to 1-2 inch, sub-acid, of excellent quality ; season, medium, July 10th to August 5th ; promises well ; yield, 7 lbs.

A. E. Sherrington (Lake Huron Station).

The currant crop was very poor the past season ; in fact, the black currants were a **total failure**, owing to the frost at the time of blooming ; reds were only half a crop, but the demand was good, and prices quite satisfactory.

Black Victoria : Bush, strong, vigorous, and hardy ; yield, none.

Cherry : Bush, a slow grower, not as vigorous as Fays ; fruit, large ; color, red ; quality, good ; ripe July 14th ; yielded 17 oz. per bush.

Champion : Bush, a strong, vigorous grower ; fruit, large, black ; color, red ; yield, none.

Fays : Bush, strong and vigorous, hardy ; fruit, large, resembles Cherry ; color, red ; quality, good ; ripe July 14th ; yield, 34 oz. ; one of the best.

Napies : A very strong and vigorous grower, very hardy ; fruit large, black ; quality, best ; yield, none.

North Star : Bush, slender and spreading ; fruit, small ; color, red ; quality, poor ; ripe, July 14th ; yield, 37 oz. ; too small to be profitable.

Pomona : Bush, a compact grower, only partly recovered from the blight of last year ; fruit, medium to large ; color, red ; quality, best ; the sweetest currant grown ; ripe July 15th ; yield, 16 oz.

Prince Albert : A strong, compact grower, with beautiful foliage ; hardy and healthy ; fruit, medium to large ; color, red ; quality good ; ripe July 18th ; yield, 87 oz.

Red Cross : Bush, a good grower, apparently hardy ; fruit large ; color, red ; quality good ; ripe July 14th ; yield, 10 oz. ; first year of fruiting.

Raby Castle : Bush, very vigorous and hardy ; fruit, small and very tart ; color, red ; ripe July 15th ; yield, 15 oz. ; very productive.

Versailles : Bush, vigorous and hardy ; fruit, large ; color, red ; quality, good ; ripe July 14th ; yield, 58 oz.

White Grape : Bush a good grower, and hardy ; fruit, large, color, white ; quality good ; yield, 27 oz. ; first year of fruiting.

Notes by Chas. Young, Richards' Landing (Algoma Station).

Currants find their ideal climate here, and I cannot say that any of those I have tried are superior to any others; the only requirement seems to be a fair amount of cutting out the old wood, and plenty of manure. Perhaps White Grape, if the color is not against it, will yield more fruit than any other. Gooseberries, which were cut out very severely last spring, gave 39 qts. to the bush. It is between Pearl and Red Jacket, which is the best, although Downing is close up to either of them.

GOOSEBERRIES.

Stanley Spillett, Nantyr, Ont.

Red Jacket has again borne a large crop of splendid fruit, but just as they began to ripen, every berry fell from the bushes. Prof. Hutt's visit to the station was opportune; he saw the bushes when about half the fruit had fallen. He instructed me to partly fill a glass jar and watch results. I did this, and in 48 hours the sides of the jar were covered with grubs. I had before concluded that this was the cause of the fruit falling. I visited every place here where gooseberries are grown, and found the same state of affairs, all the fruit down. This falling of the gooseberry has been going on for three or four years. E. D. Smith, M.P., of Winona, wrote me two years ago that Pearl, Red Jacket (Josselyn), and Downing were falling badly with him. Seven years ago the fruit fell badly, but ceased the next and following year, to any great extent. Until this season the English, or foreign, varieties were not attacked, on account (I presume) of their thick skin.

Downing, Pearl, and Champion bore a medium crop of fruit this season, but all fell off.

Whitesmith and Columbia, of the large varieties, with Autocrat, set a medium crop, but fell off; Autocrat never fails to bear big crops of fruit, but it is certainly very inferior in quality.

Having provided myself with an auto-spray, I did not use my big pump at all (Aymer). I sprayed after every shower with liver of sulphur, in all the times. Foliage and tips of young growth of wood continued to mildew throughout the whole season, so that the growth of new wood was very small, and half the length of every sucker bare and dead. The fruit up to the time of falling was perfectly clear of mildew.

GRAPES.

M. Pettit (Wentworth Station).

The grape crop this season has been much lighter than usual; several varieties did not fertilize; the weather during blooming season was cold. With that exception there was little difference from ordinary years. Good, strong, self-fertilizing varieties, such as Champion, Worden, Delaware, Niagara, Concord and Catawba, bore fair crops of well-ripened, good-flavored grapes.

Some of the varieties that do not fertilize well, such as Massasoit, Lindley, Salem, Brighton, Moyer, and several of the newer kinds, planted for experimental purposes, although they bloomed freely, set very little, and some of them no fruit.

This season's experience proves more conclusively that very few of the newer kinds are of much value; Campbell's Early is about the only exception.

Experiments in cheapening the cost of production by different systems of cultivation have been tested for three years.

The usual system has been to plow from the vine in spring; cultivate and plow to them again in July. Part of our vineyard has been treated in this way. Part of it has been fall plowed to the vines and cultivated during summer; a part has had surface cultivation only for three years, and this has given the best results. Shallow cultivation, allowing the rootlets or feeders to come near the surface, and cultivating the earth to and from the vines, with the Corban harrow and grape hoe, which is less than half the expense of plowing, has given better crops.

Below is a short description of the growth, productiveness, etc., of some of the newer kinds, as tested here:

- Amber Queen: Good quality; fairly productive; of some value.
- August Giant: Very large, black; productive; fair quality; too tender to ship.
- Arnolds: Productive; poor quality.
- Alvey: Small; poor quality.
- Black Delaware: Good quality; vine lacks vigor.
- Black Eagle: Early; does not fertilize well; no value.
- Bacchus: A wine grape of Clinton type.
- Bockman: Small pink; vine vigorous; clusters too small and loose.
- Bell: Too tender; vines winter killed.
- Black Pearl: Very productive; sour; Clinton type.
- Campbell's Early: Large; very early; fair quality; productive.
- Canada: Productive; black grape; poor quality.
- Cambridge: Much like the Concord in every respect; no better.
- Carman: Vigorous vine; not productive.
- Croton: White grape; good flavor.
- Concord Muscat: Large; white; productive; fair quality.
- Concord Chasselas: White; good flavor; vine lacks vigor.
- Cottage: Black; Concord type; berries drop from the bunch.
- Cynthiana: Good wine grape, of Clinton type.
- Cunningham: Clinton type.
- Dracut Amber: Productive; poor flavor.
- Duchess: Small; white; good quality: long keeper.
- Dr. Collier: Resembles Concord; not as productive.
- Eldorado: White; good flavor; not productive.
- Eaton: Large; black; medium quality.
- Esther: White; very weak vine; of no value.
- Etta: White; productive; poor quality.
- Elvicand: Black: vigorous vine; no value.
- Early Ohio: Early; black; vine lacks vigor.
- Early Golden: Winter killed.
- Early Victor: Black; productive; of some value.
- Eumedal: Winter killed.
- Elvira: White: very productive; poor quality.
- Faith: Weak; vine of no value.
- Florence: Very early: small: no value.
- Green Mountain: White: early; good quality: lacks vigor.
- Green's Golden: White; poor quality.
- Golden Drop: Very small; no value.
- Geneva: Winter killed.
- Grayson: Very weak vine.
- Herman: White; productive; fair quality; large.
- Haves: White: too tender.
- Herbmount: small, black wine grape.
- Ives: Small, dark grape; poor quality.
- Jefferson: Fine flavor; red, compact bunch: vine lacks vigor.

Janesville : Very early ; sour.
 Lady Washington : White ; large ; late ; no value.
 Lutie : Large ; productive ; very musky.
 Martha : White ; weak grower ; no value.
 Missouri Reisling : White ; productive ; a wine grape.
 Marion : Black ; very productive ; sour ; Clinton type.
 Mills : Fine, large, late keeping grape ; good quality ; vine lacks vigor.
 Montefiore : Dark color ; a wine grape.
 Monroe : Black ; small ; weak grower.
 Mason Seedling : Very good ; white.
 Norton's Virginia : Wine grape ; poor flavor.
 Olitie : Winter killed..
 Opal : White ; productive ; poor flavor.
 Oneida : White ; very productive ; late.
 Poughkeepsie Red : Winter killed.
 Presley : Amber ; Amber ; small ; vigorous vine.
 Requa : Good Red Roger ; productive ; long keeper.
 Romell : White ; not much value.
 Rebecca : White ; very slow grower ; no value.
 Taylor : White ; small ; not productive.
 Triumph : White ; large ; late ; sour.
 Transparent : White ; no value.
 Ulster Prolific : Winter killed.
 Woodruff Red : Large ; productive ; medium quality.
 Wyoming Red : Productive ; medium size ; inferior quality.

L. Woolverton (Maplehurst Fruit Farm).

The Lindley Grape.

A few years ago the Lindley, or Rogers' No. 9, was a favorite red grape with veyardists, and it was planted quite freely in commercial vineyards. It was also a favorite for the dessert table, for its quality is excellent, and its pretty and peculiar red color shows up its bunches finely on the dessert dish, along with Niagara and Concord, making a display of emblematic colors, the red, white and blue.

In some instances vineyards of Lindley have yielded splendid crops, amounting in one case to an average of about thirty pounds to the vine ; but it was not long before the variety began to fail in productiveness, and to become unprofitable. Perhaps this failure was due to the thrip, which is very troublesome on vines of the Lindley, for they weaken them by sucking the sap from the leaves. Anyway, whatever may be the reason, we find that of late years our Lindleys never give a good yield of fruit, and it is very difficult to select out bunches that are really perfect. We cannot, therefore, recommend the Lindley as a market variety, and, since it is scarcely the equal of the Delaware in quality, it cannot displace that excellent little grape for the dessert table.

Perhaps if we could succeed in destroying the thrip this grape might recover the place it held when President Wilder, of the celebrated Massachusetts Horticultural Society, denominated it and Jefferson "the Muscats of America," and when in the Bushberg catalogue it was recommended as a "fine table grape, one of the best of the red hybrids.

It was on the encouragement given by such favorable statements that about ten years ago we planted a vineyard of Lindleys at Maplehurst, but every year they have been growing less satisfactory, until now we expect soon to be obliged to root them out, for they are only a breeding space of thrips, which swarm over to the other varieties.

Lindley is an excellent keeping grape, holding its rich flavor in ordinary storage, well into the winter, and in a dry atmosphere it turns almost to a raisin.

There is a grape called Mary in our collection which very closely resembles Lindley, so closely, indeed, that experts are puzzled to decide whether it is really distinct or not. We notice, however, that it is a better grower, and that bunches are more compact, and, if anything, brighter in color. Perhaps it may prove better able to resist the vexatious thrip than the Lindley, and, if so, it will establish its distinct identity.

The Brighton Grape.

For the dessert table nothing is a more attractive ornament than a fruit dish piled with a choice assortment of delicious grapes, fresh and plump from one's own garden, and appetizing by reason of their beauty. A garden of well-chosen varieties would furnish the owner a constant change of kind and color; or, if he prefer it, a loyal blending of the red, white and blue.

Money cannot always command from the fruiterer that fresh condition, that perfection of beauty or that delicacy of flavor, that is to be found in grapes from one's own garden, where one may gather the fruit with his own hand just as it reaches the point of perfect maturity. And, as for the grapes offered for sale in the markets, although they may be cheap in price, they have come many a mile and met with much rough usage, and, therefore, cannot compare in value with the home-grown samples. From these considerations we do not hesitate to advise every reader, who has even the smallest city back yard, to plant a few vines for the supply of his own table. They will creep over an unsightly old fence, a barren wall or a back verandah, and thus prove ornamental as well as useful.

Among the valuable red grapes for dessert, we place the Brighton, which takes its name from the town of Brighton, N.Y., the home of its originator, Mr. Jacob Moore. He raised it from the seed of Concord, fertilized by Diana-Hamburg, so that it is one-quarter European, and to this no doubt is due both its delicate flavor and its slight tendency to mildew; while to its Labrusca, or American Fox grape, relationship we may credit the vigor of the vine, and its large, thick, dark green foliage.

The Brighton, when eaten just at maturity, is sprightly, somewhat aromatic and delicious: the pulp separates readily from the seeds without impairing the flavor. When first ready for use the color is a light red, but if left very long on the vines the color changes to so dark a crimson that it is hard to recognize it as the same variety, while its quality also deteriorates.

In season of maturity the Brighton is somewhat in advance of the Delaware, so that, of its season, it may fairly be reckoned the best red dessert grape. No one, therefore, who is planting a small collection of grapes for his own table, should omit a vine of the Brighton; and, if he will take the trouble to remove the small, imperfect bunches in the early part of the season, he will have some magnificent clusters in September for the decoration of his fruit dish.

We do not commend the Brighton to the planter of a commercial vineyard; and, unless we are much astray in our interpretation of the signs of the times, the time is not far distant when the great Northwest will be the chief market for Ontario grapes, and, therefore, we must plant most largely of such varieties as carry well and keep for a long time in first-class condition.

M. Pettit, Winona, Ont.: The Brighton is not a favorite red grape with those who grow extensively for market in this section. It does not sell as well as Red Rogers, is fully as subject to mildew, and does not bear regular crops. If heavily laden one year it will be light the next, and if allowed to hang on the vines after it is ripe it loses its sprightly flavor. I think Lindley, Agawam and Delaware are much better.

F. W. Broderick, St. Catharines: The Brighton grape may well be classed as one of our best commercial varieties. It is a good, vigorous grower, and a

productive bearer. It is a grape of excellent quality for dessert, and always meets with a ready sale on the markets. It ripens in good season, and is very rarely injured by fall frosts in our locality. It grows well on sandy loam or light gravelly soil, but may be grown with success on heavier soils.

A. W. Peart, Burlington, Ont.: I have about 60 vines of Brighton, eleven years old, and do not consider them as desirable and profitable as some other varieties. It is not so productive as the Worden or Concord, and, although of fine quality, its color—a reddish purple—is not distinctive enough to give it a higher price than the black variety unless it be known to the consumer. It is also subject to mildew.

T. H. Race, Mitchell, Ont.: Quite early in the eighties the originator sent me two vines of the Brighton grape to see how they would do in this locality. I have grown them ever since. The vine is a good grower, fairly hardy, but not what I would call a heavy bearer. The fruit ripens before the Concord, and is of better quality. I have it growing side by side with the Amber Queen, but it is not as strong a grower, nor as heavy as the latter. With me the Amber Queen has never mildewed, and in growth and bearing qualities it has always outstripped the Brighton, and for this section I would consider it a preferable grape. The Brighton, however, is a trifle earlier, a larger bunch, and somewhat more attractive in appearance.

W. T. Macoun, C.E.F., Ottawa: There are several varieties of grapes which ripen earlier than the Brighton at Ottawa, but the latter will ripen if the season is fairly favorable. If I were planting six varieties for home use here it would be among them. When mixed with other varieties which bloom at the same time, the fruit sets well, and there is a good crop of it. The quality is very good, and, even if the fruit is not thoroughly ripened, as is sometimes the case here, it is usually palatable, as it becomes sweet before being quite mature.

W. Cox, Collingwood: The Brighton does well here. I have grown it about 18 years, and I have never laid it down a winter yet. It bears well, and the fruit is of such good quality that anyone who buys them once is always ready for them again. I think a good deal of the Brighton.

W. Warnock, Goderich: I consider the Brighton the best dessert grape in its season of all the American grapes. It is one of the strongest growers, and produces very large bunches and plenty of them. The berries are extra large, dark red, of the finest flavor when used as soon as ripe, but they lose their rich flavor very soon after they ripen, so they should be used quickly after they become ripe. The vine is quite hardy with me, and a regular cropper. I am sure no one will ever regret planting a vine of Brighton if they live to taste its fruit.

The Niagara Grape.

For this grape we find plenty of admirers in the warmer sections of our Province, where it ripens its fruit to perfection. For example, Mr. E. Morris, of Fonthill, writes:

"In reply to your inquiry, I would say the Niagara grape is the best all round white grape grown in this section. It is also being used quite extensively for a wine grape, but I do not consider it a first-class grape for that purpose, as it gives the wine a foxy flavor."

Charles Young (Algoma Station).

The Concord colored this year, but was not ripe. I am satisfied we will have to look further south for our supply. Even when they do ripen here they are not fit to eat.

A. W. Peart (Burlington Station).

Barry: Vine vigorous and productive; bunch, large, fairly compact; berry, large, black, of fine quality; season, middle of September, about the same as Concord.

Catawba : Vine, very vigorous and productive ; bunch, medium size, fairly compact ; berry, medium to large, red, of fine aromatic flavor ; season, rather late, early October.

Pecklington : Vine, a moderate grower and productive ; bunch, large, shouldered, very compact and handsome ; berry, large, yellowish white, of fair quality ; season, middle of September.

Massasoit : Vine, fairly vigorous, hardy, healthy, and moderately productive ; bunch, medium size, somewhat loose ; berry, large, light red, of good quality ; season, early September.

PEACHES.

W. W. Hilborn (Southwestern Station).

For market purposes the yellow-fleshed varieties are in demand almost to the exclusion of those with white flesh. I find on enquiry that quite a large number of the consumers have never tried canning the white-fleshed sorts. In our own family we prefer them to the yellow. One difficulty in the way of white-fleshed peaches ever becoming popular is that they do not stand shipping as well as the yellow-fleshed kinds ; on this account buyers have been prejudiced against them. They are not popular with the growers on account of the extra care required in marketing.

Sneed : First to ripen, but is small and rather of indifferent quality and appearance ; valuable only to a limited extent for first early ; several days ahead of Alexander.

Alexander : This is still the leading variety for first early market. When well grown it is of fine appearance, and sells well to those who have never previously used it. It is usually sent to market while quite firm. If it is left on the tree until ripe it does not stand shipping ; therefore, it must be picked while yet hard. The purchaser is apt to be disappointed, as it is not as good as its appearance would indicate ; on this account it has greatly injured the trade in early peaches. It is a mistake for any grower to plant largely of any variety that will not give satisfaction to the consumer, as this will undoubtedly lower the price of any good sort that follows just after.

Greensboro : Perhaps the best of the first early kinds. It ripens a little earlier than Rivers, is as large, and less liable to rot.

Triumph : The first yellow-fleshed peach to ripen ; when well grown it is of good size and fine appearance. It suffers considerably from rot. It must be thinned severely, otherwise it is too small. It cannot be recommended for general planting to any great extent in commercial orchards.

St. John : This is the first really first-class variety to ripen that I have grown. It is as fine in appearance as Early Crawford, and of as good or better quality. My first shipment of it was made this season, August 21st, a week in advance of Early Crawford. The tree is about as hardy and productive as the above standard variety. One of the most valuable for the commercial orchard.

Fitzgerald : A few days later than Early Crawford ; hardier in fruit bud ; of better quality, and, taking all things into consideration, one of the most profitable sorts grown in this district for either home use or for market.

Brigden, or Garfield : Of the Early Crawford type ; ripens a little in advance, and in some respects is an improvement on the old variety.

New Prolific : A peach that succeeds well on sandy soil, but not as satisfactory on clay loam. It is very hardy and productive ; fruit of the Crawford type ; ripens a week later than the above, and is very profitable for the commercial orchard when grown on suitable soil.

Elberta : No peach of recent introduction has been planted to such an extent as this sort. The tree is not as vigorous and hardy as many other varieties ; is more subject to leaf curl than most kinds, and the fruit sometimes spot badly. When

well grown it has the best shipping qualities of any of its season, which is between the two Crawford's.

Engel Mammoth : Another peach of the Early Crawford type, that ripens before the middle of September. It has been one of the most profitable sorts I have fruited. It is of good quality, large size, and less liable to rot than most varieties. On this account it is valuable for shipping to distant markets. It is one of our best market peaches for all purposes.

Banner : This ripens just before, or with, the Smock. It is a new variety that originated in this county (Essex), and has been very largely planted by many of the leading fruit growers. The tree is very hardy and productive. Fruit medium to large, of very fine appearance; yellow, with red cheek. It colors up better than most late peaches; also of better quality. Should it continue as profitable on further trial than this, its first season in fruiting on a large scale, it will become a standard variety of more value than any other sort we have ripening at the same time.

Bronson : This ripens about the middle of September, or a little later. It is of good size, yellow, with slight blush on the sunny side; a splendid variety for canning purposes. Tree very productive, vigorous and hardy.

Golden Drop : Similar to the above, but a few days later.

Kalamazoo : Another of the same type, that ripens with, or just following, Golden Drop. The three last named are all valuable for the commercial orchard, on account of their hardiness in both tree and fruit bud, and the large crops they produce annually.

Smock : An old variety, which has not been displaced by any of the newer introductions, and is to-day the most popular late peach we have.

Salway : This is the latest sort we can plant, with any assurance that its fruit will ripen in this district. It does not always come to full maturity. It will ripen about four years out of every five. It has produced some of the most profitable crops ever grown in this locality. It sometimes cracks and spots quite badly.

John G. Mitchell, Clarksburg (Georgian Bay Fruit Station).

We have had most signal success with our peaches, both this and the previous year. Every tree on the station grounds was loaded full, and brought to maturity a fine crop of fruit. The varieties are: Red Canada, Fitzgerald, Tyhurst, Triumph, Bowslaugh's Late, Crosby, Champion, Capt. Ede, and Wonderful.

A. W. Peart, Freeman (Burlington Fruit Station).

Champion : Tree strong, vigorous grower, as well as productive; fruit, large to very large; flesh white, semi-cling; quality good; season, last of August.

Greensboro : Tree a moderate grower; fruit, medium, white flesh, cling, of fair quality; season, early August.

Longhurst : Tree, a moderate grower; fruit, medium, yellow flesh, skin yellowish pink; freestone; of good quality; season, middle of September.

Sneed : Tree, a moderate grower; fruit, small to medium, white flesh, cling; of poor quality; season, late July.

Triumph : Tree, moderate grower; fruit small, skin very red, flesh yellow, cling; season, middle of August.

Tyhurst : Tree, a moderate grower; fruit, small, yellow flesh and skin; quality, good; a freestone.

Varieties recommended for planting mentioned in order of ripening.

(Prepared by Prof. H. L. Hutt.)

1. Alexander, white-fleshed; clingstone.
2. Early Rivers, white-fleshed, semi-cling; for home use or near market.

3. Hynes, white-fleshed ; semi-clingstone.
4. Triumph, yellow-fleshed ; semi-clingstone.
5. St. John, yellow-fleshed : freestone ; good quality.
6. Champion, yellow-fleshed ; freestone ; for home use or near market ; good quality.
7. Brigden, yellow-fleshed ; freestone ; good quality.
9. Fitzgerald, yellow-fleshed ; freestone ; good quality.
10. Reeve's Favorite, yellow-fleshed ; freestone ; large size ; fair quality.
11. Elberta, yellow-fleshed ; freestone ; fair quality ; good shipper, but subject to leaf curl.
12. Old Mixon, white-fleshed : freestone : good quality.
13. Late Crawford, yellow-fleshed ; freestone : good quality.
14. Stevens, white-fleshed ; freestone ; good quality.
15. Smock, yellow-fleshed ; freestone ; very late ; fair quality ; good shipper.

PEARS.

R. L. Huggard (East Central Station).

Bartletts were a light crop, and ripened prematurely, and began to decay very soon after gathering, largely owing to the very hot and sultry weather just at the time of maturity. Clapps did fairly well ; Louise bore a light crop of fine fruit ; Seckel yielded well and sold for highest price ; Kieffers yielded best of all, but are not sold yet ; those that were thinned are very fine and large ; it pays to thin Kieffers ; Anjou bore no fruit this season ; Angouleme, Precocoe, Clairgeau, Tyson, Howell, Jules Guyot, Compte de Paris, Rutter, Lecounte and several more varieties yielded excellent crops of fine sample of fruit.

I followed clean cultivation throughout the season, and ridged up the ground for winter. All the trees made a vigorous growth, and have ripened their fruit buds well. There was no spotted or scabby fruit this season, but the codling moth got in its work and quite a number of wormy apples are the result ; although every tree was carefully sprayed four times, and some of them five times.

We applied barnyard manure, with ashes as top dressing, with good results. Pruning was commenced in March and finished April 20th. Fruit of all kinds has been good in this section, and prices have kept low, and labor scarce and wages higher than usual.

In the new varieties of pears I find the following equal to, or surpassing, most of the older varieties, viz.: Compte de Paris, larger and better than Bartlett ; Comice, Dr. Jules Guyot, Duchess, Precocoe, Dorset, Worden, Seckel.

A. W. Peart (Burlington Station).

Trees have been very free from blight this season ; neither has the scab done much damage. Owing to the scarcity of labor, infrequent cultivation here, may, in a measure, account for this.

Easter Beurre : Planted 1897 ; tree a spreading, stocky, sturdy grower, with branches somewhat straggling and wild ; fruit large, 3 1-2 x 3 inches, and often larger, roundish ovate ; green, thick skin, with russet dots, fine in grain, rich, juicy, solid and heavy ; stem medium length, deep basin, deep, narrow cavity ; season late winter, keeps until April under ordinary conditions. Its cropping qualities are yet to be seen. It seems to blow off rather early.

Josephine de Malines : Planted 1896 ; tree spreading, moderately vigorous, hardy and productive ; fruit conic obovate ; green skin, sometimes showing russet, medium size, 2 1-2 x 2 1-2 inches, melting and sweet ; stem long, basin deep and cavity light ; begins to fruit young ; season, early winter.

Lawson: Planted 1896; tree upright, moderately vigorous; fruit medium size, 3 x 2 1-2 inches, roundish, pyriform, yellow skin, with bright red cheek; quality fair; season early August.

Sudduth: Planted 1897; tree spreading, vigorous; fruit small to medium, 2 1-4 x 2 1-4 round, with thick skin; flesh soft, coarse, of poor quality; basin and cavity shallow; stem long; season November; little to recommend this pear.

Wilder: Planted 1896; tree an upright vigorous grower; fruit obtuse, pyriform, medium size, 3 x 2 1-2 inches; skin splashed with red; flesh fine in grain, tender, juicy melting, rich and sweet; not so productive, but of better quality than the Giffard; season middle of August.

Winter Nelis: Planted 1896; tree a spreading, straggling, short-pointed, stock grower; begins to bear young, and is very productive; fruit medium; size 2 1-2 x 2 1-2, roundish, obovate, russet; skin fine grained, juicy, rich, and very sweet; basin medium; cavity light; season December.

Bourgeat Quince: Planted 1896; tree a light, spreading grower; fruit large, 2 1-2 x 3 1-4, yellowish orange, pyriform; basin and cavity deep; quality good; season November.

The French pears planted in 1900 are all living and growing well, but thus far have borne no fruit.

Charles Young (Algoma Station).

Pears are better this year than formerly, but I do not think they will ever be a success commercially in the North. Keiffer bore a large crop of undersized fruit; Flemish Beauty a very few; both were planted in 1899. Bessemianka, planted two years ago, had a few specimens of poor fruit, which began to rot at the core before the fruit ripened. There are some varieties under test here. The wood of all seems hardy enough. Perhaps they may do better in time in the way of fruit.

G. C. Gaston (Simcoe Station).

Though not one of my specialties, I have several varieties of pears on trial. The Flemish Beauty is quite at home here, but of late years has been so affected by the scab, that Bordeaux mixture failed to prevent it. This year, however, it is clean and good, and I am of the opinion that when you get it free from scab there are few better pears either for canning or dessert. I am using it, however, as a stock for top working other varieties on such as Bartlett, Anjou, Clairgeau, Duchess, and others. This experiment is working satisfactorily so far. I consider it a waste of money and time to buy and plant dwarf pears in this locality; they are almost sure to fail. I recommend planting hardy standards, such as Flemish Beauty or some of the Russian varieties, and to top graft on those the varieties you wish to grow.

Keiffer flourishes almost anywhere through this country, but I consider it a sort of an outcast, only wanted when no others are available. When you see it quoted at \$2 per barrel, and at the same time other varieties are quoted from \$4 to \$6, there is something seriously wrong with the quality.

Trees of Clapp's Bartlett, Anjou, Idaho, Vermont Beauty, and others, are doing well at this station, and it is possible we can grow almost any variety of standard pear as well as they can be grown further south.

The French pears received three years ago are all growing and doing well. One of them bore a few specimens this year, but they were small and of poor quality.

There was added to the list this year two varieties, the Hoosic and Wilder.

John G. Mitchell (Georgian Bay Station).

All varieties of bearing age have done well this season. Some trees of Anjou, Clapp's Favorite, Duchess, Bartlett, and Clairgeau were a pretty sight, bending and

drooping with their loads of large, clean fruit. Quite a large number of young trees in the experimental plot are showing fruit ; amongst them are Boussock, Malines, Souvenir de Congress, Dempsey, and Winter Nelis.

The young trees received from France are now set out in the orchard, and all are living and doing well. In a few years they will make a most interesting collection.

Harold Jones (St. Lawrence Station).

Clapp's Favorite : Planted 1896 ; a vigorous, strong grower, and very healthy so far. This is the second year of fruiting ; fruit is large size and very handsome, quality excellent ; gives promise of being desirable for this section.

Clairegeau : Planted 1896 ; has made a feeble growth, but is now dying with blight ; top grafted on Bessemianka it is doing well, and has fruited once ; not desirable on its own roots ; promising top grafted on hardy stock.

Flemish Beauty : Has again produced fruit of excellent quality and appearance. This pear is undoubtedly the best pear grown in this district, notwithstanding reports to the contrary, I find no difficulty in keeping this fruit free from spot by spraying with Bordeaux mixture ; early and frequent sprayings are essential. If the fruit and foliage is kept absolutely clean up to June 15th, there is no further trouble, but late sprayings avail very little if the early spraying is neglected.

Hamel : Planted 1896 ; gave a crop of large handsome fruit in 1902, but the trees are now dying with blight.

Ritson : Planted 1896 ; a strong, vigorous, upright grower ; healthy ; a small crop of medium-sized fruit of good quality. This variety gives promise of being a success here, and may be recommended for general planting for home use.

Keiffer : A hardy, annual bearer, that succeeds well here ; the fruit does not attain the same size and perfection as in Western Ontario, but may be grown successfully for home use as a cooking pear. If picked about the 10th of October and allowed to ripen in a dark place, they will put on a handsome coloring, and are fair as a dessert pear.

Sudduth : Planted 1897 ; this pear came to me under seal ; a strong moderate grower ; healthy ; fruit medium size, pale yellow ; quality poor ; of very little value.

Koonce : Planted 1897 ; has produced a few samples each year, fruit large, similar in form to Bartlett ; of very poor quality.

Lincoln : Planted in 1895 ; fruited three years ; yield this year was three pecks to the tree ; fruit medium size and of fair quality.

Dr. Jules Guyot : Planted 1895 ; commenced fruiting second year and has borne a fair crop every year since, of large handsome fruit, similar in form to Bartlett, quality only medium.

White Doyenne : Planted in 1895 ; has made good growth, but produced very little fruit.

Keiffer : Planted 1895 ; has made the most vigorous growth of any variety of pear in the plot ; produced three bushels to the tree ; 75 per cent. No. 1.

Summer Doyenne : Planted in 1895 ; fruiting for three years ; average, one peck to the tree this year ; ripened early.

Beurre Giffard : Planted 1895 ; has fruited for some years ; had a few specimens this year ; ripened last of August.

Winter Nelis : Planted 1895 ; has fruited sparingly for four years ; one peck this year ; medium size ; tree drooping ; has made good growth.

Margaret : Planted 1895 ; fruited two years ; requires to be picked very early ; decays at core if left on the tree to ripen.

Idaho : Top grafted 1895 ; loads sparingly each year ; similar in form to Sheldon, but with less russett color ; of good quality.

PLUMS.

John G. Mitchell (Georgian Bay Station).

The object of this report is to answer desired information for the general benefit of planters, rather than to give detailed descriptions of individual varieties. Plums have been an enormous crop throughout this district, so much so, that many thousands of baskets were not gathered at all, but left to spoil in the orchards. On the station grounds alone fully one thousand baskets were allowed to go to waste, not salable at prices which would pay expenses, and the strangest thing about it was that there were less plums shipped from here than in many a former year. Now, there must be some reason for this. During the summer I went to a great deal of trouble to find out, if possible, what the great buying public most demands and appreciates. I interviewed dealers, traders and canners, and they all with one accord condemn the Japan plums on account of their poor quality. The dealers do not want them, because when known they will not sell.

Our traders, who distribute thousands of baskets along the north shore of Georgian Bay and Lake Huron, as far as Sault Ste. Marie, do not want them, and some of them won't buy them at all.

The canners say they are of poor quality, and put up a very poor class of goods, and as a canning firm's reputation stands on his brand, they must have plums of good quality. They pay ten to fifteen cents more per bushel for the yellow European varieties than for the colored blue and red plums. Now, the reason for such low prices may be partly that a lot of poor stuff going forward which is not wanted must reflect against the sale of something better. This has been my own opinion. I always said, Go slow with Japan plums. If I were planting a plum orchard again, and I likely will, I would not put a Japan variety in it, unless it would be Red June, and then very sparingly.

European Plums.

After several year's test, these seem without doubt destined to be the plums for the commercial orchards of Ontario. The following have been thoroughly tested here : they are sufficiently hardy, good growers and bearers, and of admirably quality : Washington, Imperial Gage, Brashaw, Quackenbos or Glass, Prune d'Agen, Arch Duke, Diamond, Monarch, Montreal, Yellow Egg, Pond's Seedling, Coe's Golden Drop, Reine Claude, Whitby, German, and Baker Prunes. These are the cream of all our 170 or more varieties, so far as we know at present. Red June, a Japan, on account of its earliness, may be added to this list.

Japan Plums.

There already seems to be too many Japan plums planted. Although quite hardy, rapid growers, good bearers, and of most attractive appearance, their quality, as compared with the best Europeans, is so poor that there is not much demand for them where they are well known.

The following are the best quality and most desirable of all we have in test : Burbank, Chabot, Red June, and Satsuma or blood. Wickson, the best in quality of all the Japan, is apparently too tender. I am told that it does not succeed well even in Southern Ontario.

American or Native Plums

of which we have quite a number, are of no practical value for the commercial orchard. We occasionally ship a few baskets to try how they sell. They were invariably not sold, or sold for less than expenses. Stoddard, Milton, Cheney, Chas. Down-

ing, Forest Rose, and Wolf appear to be about the best we have, and might be of some use where it might be too cold for the *Domestica* to succeed.

W. W. Hilborn (Southwestern Station).

Varieties of Japan Plums.

Willard : This was the first to ripen, but the fruit is of such poor quality that it is of no value.

Red June : This is the earliest good sort, perhaps the most profitable, on account of its early ripening, fine appearance, and of rather good quality.

Abundance : Ripens soon after the above, of some value for dessert, but of no value for canning.

Burbank : Several days later than Abundance ; of little value for dessert, but good for canning purposes.

Satsuma : This is my choice of all the Japan plums I have seen. It is gaining in popularity where best known. For canning purposes it has few equals. This season I found it easier to sell this sort at 25 cents per 12-quart basket than to give away Lombards, which were ripe at the same time.

Wickson : A variety of some promise on account of its fine appearance and large size.

Climax : This is the most promising of all the newer Japans I have tested. On young trees it produced a heavy crop of fruit that ripened with the Abundance ; of about the size and form of Wickson, but much darker in color.

Chabot : This resembles Abundance, ripens later, not of as good quality.

Hale : A plum of fine appearance and rather nice in flavor ; has some value for dessert ; rots badly ; of no value for market.

Juicy : A very strong grower ; produces but little fruit ; of no value.

Berkmans : Tree and fruit resembles Burbank, but not of as good quality, and ripens later.

A number of other varieties have ripened a few specimens, but none of them gave promise of any special value.

In my opinion, it will be easy to overdo the planting of Japan plums. My choice for market purposes are : Red June, Burbank, Satsuma, and Wickson, of the older varieties, and Climax of the later introduction.

THE JAPAN PLUMS.

L. Woolverton (Maplehurst Fruit Farm).

Although only introduced into America some thirty years, these plums have become very widely disseminated, receiving probably a larger place in our orchards than their real merit deserves.

Many varieties of them have been introduced and pushed upon the attention of the unsuspecting fruit grower, who has too often found them a sad disappointment. The Wickson, for example, has been much boomed, and truly is a large, fine variety ; but alas ! so far in our orchard, and we have planted about 100 trees, it has proved itself most unproductive.

Some of us were discussing the Japan plums at the Industrial, where Mr. John Mitchell, of Clarksburg, Ont., showed a fine collection, and the general agreement was that the following four varieties were the choice of all the Japans to cover the season, viz., Red June, Abundance, Burbank, and Chabot.

Mr. S. D. Willard, of Geneva, New York, speaking before the Western New York Fruit Growers, said of these Japans, that owing to their early blossoming his crop

of Abundance was nearly ruined by spring frosts, when, hearing of the Burbank, he had them all top-worked to the latter variety. "I like," he said, "the Abundance to eat out of hand, but I do not think it as good a handler and shipper as the Burbank and some of the others. We have a good many Burbanks. Some seasons we have had four or five thousand baskets. A few years ago, when looking up something better, if we could, we ran on to the Red June, and in conference with a man from Lake Michigan. I learned that side by side with the Burbank, when the spring frost had done injury to the Burbank, the Red June would come out in good shape. Following up the idea in connection with the fact that it is the earliest of all plums to ripen that I know of, we have planted and fruited them quite largely. We have had them ripe and in good shipping condition on the 21st of July. I made up my mind that it was a good plum for the orchard man, and we have found it so. We had something over a thousand baskets of them last year (1901), and they brought a higher price per basket than any other plums we shipped, except some of the old varieties that came on the market after the other varieties were out of the way."

Red June.

Red June : We have received the following replies to inquiries regarding the behavior of the Red June in various sections of Ontario :

T. H. Race, Mitchell : The only varieties among the Japan plums that I have tried on my grounds here are the Prunus Simoni, Wickson, Abundance, and Burbank. The first two I have discarded ; the third I have planted in where I threw all my Lombards out, and I value it very highly. The Burbank is my second favorite, though in some respects it is a better plum than the Abundance. Like the Abundance tree, the Burbank must be cut back very severely in order to get a good, shapely tree. This is especially important with the Burbank, as the yearly growth is very great, and the tree is of a sprawling nature. It should be cut back to one foot every year if a good, solid top is to be secured. It will take more years to get a good tree, but it will last all the more years, and bears its fruit better after it has been secured. On the properly pruned tree the Burbank is a beautiful plum.

A. E. Sherrington, Walkerton : In my opinion the Red June is going to be one of the most valuable plums for either home uses or market, chiefly owing to its earliness. It is a good keeper, and consequently an excellent shipper.

M. Pettit, Winona : I have fruited the Red June plum for years. The trees grow well, and bear regular crops from the third year of planting. In quality it is not quite as good as Lombard, which it resembles somewhat in appearance, though a little smaller in size. It ripens about the first of August, and being the first plum to ripen, it is valuable for market, bringing about double the price of ordinary plums. As soon, however, as this plum is planted in large quantities, it is a question if it will bring any higher price than the other varieties.

It should be valuable for the family garden, because it extends the season for using fresh plums.

W. W. Hilborn, Leamington : I have been very favorably impressed with this variety. The tree is rather more spreading in habit than the Abundance, and seems to be quite productive. The fruit is roundish conical, with a distinct point, and rather above medium size. The color is quite dark when fully ripe ; the quality is good. It ripens just before Abundance, and on this account it promises to be valuable for market. I have not tested it long enough to know if it has any special weakness.

R. L. Huggard, Whitby : I consider the Red June a profitable early plum. Its color will always attract buyers. The fruit is especially valuable for canning, as the flesh remains firm in cooking and retains the flavor.

G. C. Caston, Craighurst : I reply to your enquiry about the Red June plum. I think very highly of it. It began to bear the second year after planting, and, with the

exception of this year, bore regularly. It comes early. I have only one that comes in ahead of it (the Early Botan), and it bears a heavy crop. I always include the Red June when recommending a list of plums for this section. The quality is, I think, very good. It is large in size, and quite handsome. I have no hesitation in recommending it for this section.

Charles Young, Richards' Landing: My Red June plum tree bore a few fruits last year, and if I were planting out a plum orchard I would not hesitate to include the Red June. The trees here (St. Joseph's Island) have proved perfectly hardy. I measured some of last year's growth to-day (December 23rd), and it was five feet in length. The trees promise fruit next year.

J. G. Mitchell, Clarksburg: I can unhesitatingly endorse the Red June as one of the most desirable of the Japan plums, not so much for its quality, which is only fair as compared with the best Europeans, but for the season in which it ripens. It is the earliest good plum we have. The tree is a strong grower, forming a beautiful symmetrical top, and begins to bear the third or fourth year. The fruit is medium to large; color a bright vermillion red, not ripening all at once, but covering about two weeks; season, with us, last of July to middle of August; hardy.

It is only about twenty years since the Japan plums began to be propagated in America for commercial purposes, and it is wonderful how quick they have become distributed throughout the United States and Canada, while still almost unknown in Europe. Perhaps this is because the European varieties succeed so well there that the Japan varieties are not sought after in that country, while here the former class are subject to many drawbacks, such as black knot, plum rot, etc., from which the Japan varieties are apparently more or less exempt.

Chabot.

The Chabot first fruited at Maplehurst in 1902, and at once attracted our attention as being exceptionally beautiful in appearance and delicious for eating. It was imported from Japan by Mr. Chabot, of Berkely, California, and afterwards sold to Mr. Burbank, who introduced it to the trade in the year 1886. It has borne several names, as, for example, Yellow Japan, Bailey, etc., but in justice to the importer, it is now generally known as the Chabot. A good many are puzzled over the pronunciation, so we may as well state that the accent is upon the last syllable; phonetically written it is "Shabbot."

This plum has been tested at our Georgian Bay station by Mr. John Mitchell, of Clarksburg, and described as follows:

"A very strong grower, of a large, beautiful and stately top; bears the third year; fruit about the same size and shape as the Red June, but not quite so conical; skin amber, and nearly covered with red spots and markings; very attractive; season, late in September; very hardy."

At Maplehurst our record of its season is the first half of September, but perhaps it would be ten days later at Clarksburg. It did not bear the third year after planting with us, indeed, it was about the fifth year before we had any samples. No doubt early bearing depends a good deal upon the soil; and our deep, rich sandy loam encourages the production of too much wood and too little fruit. In respect to size also, it was larger with us than Red June, indeed, almost equal to Washington; but with us the crop was light, while with Mr. Mitchell probably it was heavy.

Every one who has fruited it gives the Chabot credit for being the best Japan of its season, which is about two weeks later than Burbank. The flesh is yellow, and the flavor very pleasant, though inclined to cling to the stone.

Green Gage.

The Green Gage is a good representative of a very important group of domestic plums, which is both very ancient and very desirable. Other well-known varieties of

the Green Gage group are Reine Claude, Imperial Gage, McLaughlin, Jefferson, Washington, General Hand, Peter's Gage, Golden Gage, etc.

In Ontario the most popular variety of the Green Gage group or plums, especially for cooking purposes, is the Reine Claude de Bavay, commonly known among us as Reine Claude, but in the catalogue of the American Pomological Society called Bavay. The fruit of this plum is larger than that of the Green Gage; the tree is a stronger grower, and hence, perhaps, better suited to the commercial orchard, but in quality no one of the group excels the old typical kind, the Green Gage.

Dr. Robert Hogg, author of the "Fruit Manual" of Great Britain, gives the following history of the origin of this plum:

This universally known and highly esteemed fruit has been longer in this country (England) than has been generally supposed. It is said to have been introduced at the beginning of the last century by Sir Thomas Gage, of Hengrave Hall, near Bury St. Edmunds, who procured it from his brother, the Rev. John Gage, a Roman Catholic priest, then resident in Paris. In course of time it became known as the Green Gage plum. In France, although it has many names, that by which it is best known is Grosse Reine Claude, to distinguish it from a smaller and much inferior plum called Reine Claude Petite. The Green Gage is supposed to be a native of Greece, and to have been introduced at an early period from Italy, where it is called Verdochia. From Italy it has passed into France, during the reign of Francis I., and was named in honor of his consort, Queen Claude. Shortly afterwards it found its way into England under its original Italian name, Verdochia, from which we may infer that it was brought direct from Italy. It is mentioned by Parkinson in 1629 under the name of Verdoch, and from the way in which he speaks of it, it seems to have been not at all rare, nor even new. Even so late as the middle of the last century, after it had been reintroduced and extensively grown under the name of Green Gage, it continued to bear its original title, and to be regarded as a distinct sort from the Green Gage.

If any one is making a selection of plums for his home garden, we would advise him not to omit a tree of the Green Gage for kitchen uses; or, if he wishes to combine both kitchen and market purposes, then let him plant the Reine Claude.

The Green Gage tree is not a rapid grower, but it is healthy and fairly productive. The fruit is smaller than Reine Claude, and must be thinned to make it reach a proper size. The skin is greenish, yellowing toward maturity; the flesh is pale green in color, and the texture melting and juicy; the flavor is rich, sweet, and agreeable. In season it is earlier than Reine Claude, coming in about the middle of August.

Harold Jones, Maitland (St. Lawrence District): The Green Gage plum has not proved generally satisfactory in this section. Trees that I planted in 1897 are partly dead and have never blossomed. They suffered during the winter of 1902. I know of two trees that are protected by buildings from the north wind that have given good crops of fruit in favorable years, but, generally speaking, the Green Gage is an uncertain cropper here and not profitable.

My experience and observation teach that European plums are generally unsatisfactory in this latitude, but some plums of the native American class are of good quality and succeed well.

A. E. Sherrington, Walkerton: The Green Gage plum is hardy and productive here, but in my opinion not as valuable as the Imperial Gage.

J. G. Mitchell, Clarksburg: The market demands large and showy fruit, and the Green Gage, being rather small, has always sold at a low price here. Where the Reine Claude succeeds, which is really a large Green Gage, I think there is little use in growing the small Green Gage.

W. M. Orr, Fruitland: We do not grow the Green Gage. Although the quality of the fruit is good, I consider it too small, and the tree is a poor grower. I prefer the Imperial Gage, of which the fruit is large and of good quality, and the tree vigorous and productive.

Charles Ellis, Meaford: Very few Green Gage plums are grown about here. The Reine Claude is often sold under that name, but the true Green Gage is small, not very productive, so far as I have seen it, but is very good for home use.

Charles Lowry, Queenston: The Green Gage is highly esteemed, both as to productiveness of tree and quality of fruit, but the sale is limited. Every year I think the price of plums grow less, and unless some foreign market opens for them there is little hope for plum growers.

F. G. Stewart, Homers: The Green Gage is considered the best canning plum, and we get more for it at the factories than for any other. For home use it is superseded by the Reine Claude.

A. W. Peart, Freeman (Burlington Station).

Blood No. 2: Planted in 1898; tree upright, spreading, vigorous; fruit, medium, conical, round, dark red with purple bloom, very firm; flesh red to stone; season, middle of September.

Abundance: Planted 1896; tree upright, spreading, vigorous, hardy and productive; fruit yellow, with crimson flesh, large, oblong-round; fruits young; quality fair; season middle of August.

Burbank: Planted 1896; tree very spreading, vigorous, straggling grower, but by annually cutting away lower horizontal branches may be kept in fair shape; too productive every other year; requires thinning; bears very young; fruit medium to large, oblong-round, yellow, mantled with crimson; quality fair; season late August.

Berckmans: Planted 1898; tree spreading, medium vigor; fruit medium to large, oblong-oval, dark red; flesh very soft, juicy, of poor quality; season late July.

Normands: Planted 1898; tree spreading, vigorous, and moderately productive; fruit medium, roundish-oval, yellow flesh, fairly firm, rich, juicy, sweet and aromatic, very fine flavor.

Satsuma: Planted 1896; tree upright, spreading, stocky, vigorous and productive with age. Three trees this year gave 15 twelve-quart baskets. Fruit medium to large, conic, round, dark red, with purple bloom; flesh very firm, red to the pit; excellent for canning; season middle of September.

Blood No. 4: Resembles this variety very much

G. C. Caston (Simcoe Station).

In the spring of 1895 I planted 14 varieties of plums of the European class. These all flourished nicely for a few years, and bore a few fine crops, but there is only one variety of that fourteen that is sound and thrifty to-day, and that variety is the Staunton. Northwest of here a few miles, near the Georgian Bay, all kinds of plums flourish, and continue to bear until they are large, old trees. The climatic conditions required for successful plum culture is close proximity to large bodies of water.

Some of the Japan varieties seem to thrive here, though many of them, such as Shensi, Ogon, Satsuma, and several others, have failed. Howe's, Burbank, Abundance, and Red June, are doing fairly well.

I have tested here some forty varieties of plums, and the results may be summed up thus: Of the European class, the only one that has succeeded well is the Staunton, and of the Japans the three above mentioned are the best. A number of the American class have been tested, and those that have fruited are not worth growing.

It is not advisable for anyone living a distance inland from the great lakes to go extensively into plum culture, and, further, the failure to grow plums on a large scale is not a serious disadvantage in fruit culture, as the growing of plums is now overdone to such an extent that the market is overstocked, and the prices go so low there can be little or no profit in them."

M. Pettit (Wentworth Station).

The immense plum crop of this season has convinced the growers that too many plum orchards have been planted. Not more than two-thirds of the crop was marketed, on account of rot and low prices.

One-half of the plum orchards planted have not attained full bearing age.

We have found it impossible to control the rot by spraying with Bordeaux mixture this season, on account of the showery weather during August. All varieties suffered, the very early kinds, such as Red June and Red Nagate, the least. They were gathered July 31st, and sold at 40 cents per basket. We think there would be a limited demand for plums of such inferior quality at that season.

Charles Young (Algoma Station).

Plums have done very well considering the age of the trees, but I must moderate my praise of the Japans somewhat this year. They have made any amount of wood, but given very little fruit. Perhaps I have manured too freely. The Europeans have not made so much wood, but have yielded more fruit, Lombard especially; Moore's Arctic and Reine Claude, a full crop. It is a pity the native Americana plums have such brittle tops; if the wood was only tougher they might be valuable in the north; but I have found just as good fruit and tougher wood among our Canadian natives in the woods, and with a deeper, richer color than any on the experimental grounds. Of all the varieties I have tested in plums, some fifteen, all are apparently hardy, except America, which freezes on the south side of the top every year. My trees now are all one-sided, and no amount of pruning can get them into proper shape. They have not had any fruit, and at this date we may set them down as cumberers of the ground.

A. E. Sherrington (Lake Huron Station).

There are now nearly fifty varieties planted, and all doing well, with the exception of Wickson. The crop was not large this season, with the exception of Burbank, Victoria, and Lombard. The crop was all disposed of at very good prices and very few wasted.

Abundance : Tree, vigorous and hardy; fruit large; color, reddish purple; quality, good; yield per tree, three baskets, last year two baskets; bloomed May the 9th; ripe August 10th; eight years old.

Burbank : Tree, spreading, vigorous and hardy; fruit medium to large; color, red; quality, good; yield per tree, seventeen baskets, none last year; bloomed May 9th; ripe August the 27th; eight years old.

Bradshaw : Tree, upright to spreading, hardy and vigorous; fruit, very large; color, purple; quality, good; did not fruit this year, last year two baskets.

Cole's Golden Drop : Tree, strong, vigorous and hardy; fruit, large; quality, medium to good; color, yellow to light green; yield, two baskets, last year six; bloomed May the 10th; ripe September 4th.

Duane's Purple : Tree, upright, spreading, vigorous and hardy; fruit, large; color, dark purple; quality, good; bloomed May the 10th; ripe September 20th; yield, one-quarter of a basket, last year three-quarters of a basket.

Field : Tree, an upright grower, vigorous and hardy; fruit, medium to large; color, purple; quality, good; yield, none, last year one-half basket.

Geuli : Tree, upright to spreading, vigorous and hardy; fruit, large; color, purple; quality, first rate; bloomed May 10th; ripe August 27th; yield seven baskets, last year one and three-quarters; this is a first-class plum.

Grand Duke : Tree, a strong grower, upright to spreading, hardy, and a persistent bearer; fruit, large, with a heavy bloom; quality, good; makes a first-class shipper;

yield, one basket, last year three baskets ; bloomed May 10th ; ripe September 25th ; a very profitable variety.

Hale : Tree, upright to spreading, vigorous and hardy ; fruit, large ; color, yellow ; quality, first-class as a dessert plum ; yield, eight baskets, last year three baskets ; bloomed May 8th ; ripe August 24th.

Hugh's Seedling : Tree, a good grower, and hardy ; fruit, medium to large ; color, yellow, resembles Yellow Egg ; yield, none, last year one basket.

Imperial Gage : Tree, a vigorous and compact grower, hardy ; fruit, medium size ; color, yellow ; quality, best ; bloomed May 10th ; ripe August 27th ; yield, three baskets, last year five and two-thirds baskets ; a very fine plum.

Lombard : This variety is of long standing, and considered to be a reliable plum for commercial purposes, as well as for home use ; but the tree is liable to over-bear, and in such case the fruit will be small ; it requires to be thinned to give best results ; tree, hardy and vigorous ; fruit, medium to large ; color, reddish purple ; quality, good ; bloomed May 10th ; ripe September 1st ; yield, six baskets, last year two and a half baskets.

Monarch : Tree, vigorous and hardy ; an early bearer ; very profitable ; fruit, large ; color, purple, with heavy bloom ; quality, good ; flesh, firm, making a splendid shipper ; bloomed May 10th ; ripe September 20th ; yield, one basket, last year four.

Moore's Arctic : Tree, a fair grower, and hardy ; an early and annual bearer ; fruit, small to medium ; color, dark purple, with bloom ; quality, very good ; bloomed May 7th ; ripe August 24th ; yield, seven baskets, last year six baskets ; should be left on tree until fully ripe to give best results.

McLaughlin ; tree, a vigorous grower ; early and annual bearer ; fruit, large ; color, yellow, mottled with red ; quality, first-class ; bloomed May 10th ; ripe August 26th ; yield, half basket, last year two baskets.

Pond's Seedling : Tree, an upright grower ; fruit, very large ; color, red ; quality fair ; yield, none, last year one and a quarter baskets ; not profitable owing to its being so subject to rot.

Purple Egg : Tree, a fine grower, and hardy ; fruit, large ; color, purple ; quality, good ; bloomed May 10th ; ripe September 20th ; yield one basket, last year two and a half baskets ; a fine shipping variety.

Quackenbos : Tree, hardy, vigorous, upright, spreading ; fruit, very large ; color, purple, with bloom ; quality, good when fully ripe ; bloomed May 10th ; ripe September 10th ; yield, four baskets, last year two ; a very fine plum.

Red June : Tree, a strong, vigorous grower, of the Japanese variety, hardy, an early bearer, as all this class are ; fruit, large ; color, dark red ; quality, very good ; bloomed May 8th ; ripe August 10th ; yield, one basket, last year only a few ; four years old.

Spaulding : Tree, a strong grower, spreading, hardy ; fruit, medium ; color, yellow ; quality, good ; flavor, very sweet ; bloomed May 9th ; ripe August 27th ; yield, six baskets, last year five baskets.

Shipper's Pride : Tree, upright, strong and vigorous grower, hardy ; fruit, medium to large ; color purple ; quality, very good ; flesh, firm, a good shipper ; bloomed May 10th ; ripe September 4th ; yield, six baskets, last year two baskets.

Satsuma : Tree, a strong, vigorous grower, and hardy, of the Japanese class ; fruit, large ; quality, good for cooking ; color, dark red, with colored flesh, firm, making it a good shipper ; bloomed May 9th ; ripe, September 15th ; yield, two baskets, last year seven.

Smith's Orleans : Tree, a strong, vigorous grower, hardy ; fruit, large ; color, purple ; quality, good ; bloomed May 10th ; ripe August 27th ; yield, four baskets.

Saunders : Tree, rather poor grower, appears to be hardy ; fruit, medium ; color, yellow ; quality, very good ; of a pleasant flavor ; needs further trial.

Victoria : Tree, a very good grower, foliage large and healthy, hardy, and an annual bearer ; fruit, large ; color, skin yellow, mottled with red ; quality, good ;

bloomed May the 9th ; ripe August 27th ; yield, six baskets ; last year two baskets ; a very profitable variety.

Washington : Tree, a fine grower, hardy, but rather shy bearer ; fruit, very large ; color, a rich yellow ; quality, of the best ; bloomed May 9th ; ripe, August 27th ; yield, two baskets, last year one basket.

Wickson : Tree, a slender, upright grower, tender ; fruit, large ; color, light red ; quality, only fair ; bloomed May 8th ; ripe September 27th ; yield, only a few ; the tree was damaged by frost ; too tender.

Yellow Egg : Tree, a good, vigorous grower, hardy, and an early bearer ; fruit large to very large ; color, yellow ; quality, very good ; bloomed May 10th ; ripe September 20th ; yield, two baskets, last year three baskets ; a profitable variety.

Stanley Spillett (Gooseberry Sub-station).

Japan plums have made splendid growth of wood ; only a little fruit, of fine quality ; on light soil, with a southerly exposure, and well protected by hill to north.

Burbank, eight years set, has given three tremendous crops. This season the fruit was marketed two weeks before other varieties appeared upon the market. This meant something this season, as 50 cents per 12-qt. basket was easily obtained. Good plums sold here at 25 cents later on.

R. L. Huggard (East Central Station).

Plums were a very good average crop ; very few rotted, and no curculio visible, but prices ruled so low profits were small, and some of my neighbors did not pick their fruit, stating that it did not pay them to do so.

Of the varieties, Burbank stands first for yield, and Washington highest in price, Red June and Saunders being earliest, and Vail's Seedling (a large yellow plum) latest.

Harold Jones (St. Lawrence Station).

Generally throughout the plum growing sections of Ontario this year this fruit has been produced in abundance, and thousands of baskets allowed to go to waste, but this district had an entire failure, and consumers bought all their plums from those more favored.

European Plums.

European plums did not produce a single specimen ; Japanese all failed, with the exception of Red June, which had a few fruits ; Americans bore light crops on some varieties, but not nearly the crop of 1902.

The following summary will give some idea of the odds existing against successful plum growing in the St. Lawrence counties :

Geuii : Planted 1890 ; tree, strong, vigorous grower, healthy ; fruit buds injured more or less every year ; bore two or three specimens in 1900, four or five fruits in 1902, none this year ; the buds are injured during the midwinter months, for in early April they will drop off if touched by the finger.

Lombard : Planted 1895 ; strong, vigorous, healthy grower, but the buds are winter killed four years out of five. The history of this tree gives a few plums in 1897, a fair crop in 1900 and none since nor in intervening years, so that really there has been only one crop of fruit in eight years.

These two varieties are the only ones of the European class that have borne any fruit with me, though several varieties have developed fruit buds only to be destroyed the following winter.

Japanese Plums.

Abundance : Planted 1896 ; vigorous, healthy tree ; gave me two plums in 1897 and one plum in 1902 ; buds perish during midwinter.

Burbank : Planted 1898 ; vigorous, healthy tree, of sprawling habit ; forms thousands of buds every year, but only blossomed and set fruit once, two years after planting.

Ogon : Planted 1898 ; a vigorous, upright tree ; gave a few fruits in 1900.

I have nine other varieties of Japanese that were planted in 1898 and 1899, but have not set fruit yet, except Red June, that gave a few specimens this year.

America (Hybrid) : Planted 1901 ; bore a few fruits in 1902, but was injured in the wood and partly died the following winter.

Gold (Hybrid) : Planted 1898, gave five fruits in 1900, none since, and one tree injured and dying.

A full report of the American plums is given on page 59 of 1902 report, and I have very little more to add except that Weaver gave a full crop of fruit this year of only fair quality, not equal to Hammer or Whitaker.

These plums are of very little value to the grower when placed on the market in competition with Europeans, for buyers and commission men will tell you that they have no use for wild plums. However, such varieties as Whitaker, Hammer, Forest Rose, Stoddard, Hawkeye, etc., are varieties that are valuable here for people to grow for their own use.

RASPBERRIES.

A. E. Sherrington (Lake Huron Station).

The raspberry crop this season was all one could desire, although they were somewhat damaged in the spring by late frost ; but the warm, showery weather later brought the plants on in fine shape ; the yield and quality of fruit was excellent, especially such varieties as Cuthbert, Phoenix, Miller, and Loudon ; but Loudon cannot compare with Cuthbert for yield. The red raspberries are cultivated on the hedge row system. The rows are six feet apart, and allowed to spread to thirty inches ; pruning is done by removing the old canes, either in the spring or fall, and the ends of fruiting canes removed early in the spring. Blackcaps are planted in rows six feet apart, and three feet apart in the row ; the young canes are pinched back when about twenty or twenty-four inches high ; by this method they throw out their side branches nearer the ground, making a much stronger plant ; early in the spring these side branches are shortened to about twenty or twenty-four inches. Clean cultivation is practiced ; that is, they are kept clean by frequent and shallow cultivation ; this also retains the moisture which is very important in the growing of raspberries. There are a few varieties which it is almost impossible to make cane enough to produce any fruit, let alone a profitable crop.

Brandywine : A rather poor grower ; canes small and weak, not vigorous enough ; fruit, small and soft ; flavor, very good ; color red, ripe July 1st ; last picking, July 17th ; yield, 97 oz. ; not profitable.

Cuthbert : A strong, vigorous grower, fairly hardy and healthy ; fruit, large, firm ; color, red ; quality, the best ; ripe July 4th ; last picking, August 8th ; yield, 264 oz. ; the best red berry grown.

Columbia : Plant, strong, vigorous and healthy, rather tender ; fruit, large, firm ; fair quality ; color purple ; ripe, July 13th ; last picking, August 1st ; yield, 193 oz. ; not profitable on account of color.

Golden Queen : Plant, strong, vigorous and hardy ; fruit, large ; quality, good ; color, yellow ; ripe, July 9th ; last picking August 5th ; yield, 79 oz. ; the best light colored variety.

Hilborn : Plant, hardy, vigorous and healthy ; fruit, medium to large, firm ; quality, good ; color, black ; ripe July 15th ; last picking, 28th ; yield, 36 oz., two plants.

Kansas : Fairly vigorous, but not as hardy as it ought to be ; fruit, large, firm, with good quality ; color, black ; ripe July 9th ; last picking, the 19th ; yield, 155 oz.

Marlboro : Canes, strong, but of a dwarfish nature, lacks vigor ; fruit, large, firm, of fair quality ; color, bright red ; ripe July 4th ; last picking the 24th ; yield, 127 oz. ; a good shipper.

Miller : Plant, fairly vigorous and hardy ; fruit, medium to large ; color, bright red, firm ; quality, very good ; ripe July 1st, last picking August 1st ; yield 200 oz.

Ohio : Plant rather tender and weak ; fruit medium to large ; color black ; quality, good ; ripe July 13th ; last picking 20th ; yield, 26 oz., one plant.

Older : Canes of a trailing nature, but can be kept well together if properly cut back ; fruit, large, very black ; quality, good ; ripe July 9th, last picking 28th ; yield, 280 oz. ; a promising variety.

Phoenix : Plant, fairly vigorous ; perfectly hardy ; fruit, large ; color, red ; quality, first rate ; ripe July 1st ; last picking August 5th ; yield, 380 oz. ; a very profitable variety.

Pioneer : Plant, fairly vigorous, half hardy ; fruit medium ; color, black ; quality, very good ; ripe July 13th ; last picking the 20th ; yield, 35 oz. ; not profitable.

Reliance : Plant, fairly vigorous, healthy and hardy ; fruit, medium to large ; quality, very good, too soft for shipping, but a good local berry ; ripe July 1st ; last picking the 28th ; yield, 70 oz. ; a good table berry.

Smith's Giant : Plant, strong and vigorous, slightly tender, but healthy ; fruit, very large ; quality, good ; color, black ; ripe July 17th ; last picking August 2nd ; yield, 30 oz., two plants.

Strawberry Raspberry : This strange plant is a great success here ; a plot of four feet by twenty yielded 50 boxes of fruit ; the plant grows about 18 inches high, dying down in the fall ; the fruit is produced on the present year's growth ; fruit, large ; color, bright red ; quality poor ; of no value.

Thompson : Plant, hardy, but not vigorous enough, canes small ; fruit, small and soft ; color, red, quality, fair ; ripe, July 1st ; last picking August 1st ; yield 135 oz.

Turner : Plant, not as vigorous as some varieties, but makes a good, strong cane, very hardy ; fruit, medium ; color dark red ; quality, good ; first-class table berry ; ripe July 4th ; last picking August 5th ; yield, 79 oz.

Taylor : Plant, fairly vigorous, not hardy ; fruit, medium ; color, black ; quality, very good ; ripe July 9th ; last picking the 20th ; yield, 49 oz.

John G. Mitchell (Georgian Bay Station).

Among the red raspberries the Cuthbert still holds first place for profit, and is in every way the most desirable ; but all varieties succeed very well ; there is no winter killing, as the deep snow affords them ample protection. Among the blacks we give Hilborn and Gregg the preference over anything we have tried.

G. C. Caston (Simcoe Station).

The Cuthbert is still the best variety of raspberry here. Its chief fault is the winter killing of the tips, so that much of what should be the bearing wood is lost. I am looking for a berry as good as the Cuthbert, that has not this fault ; that will not kill back in winter, and will produce a berry of as good quality as the Cuthbert.

STRAWBERRIES.

E. B. Stevenson, Arkwright, Ont.

The season of 1903 could hardly be called a normal one. On this account it was not a very easy thing to tell which variety could be truly called the earliest. The claim has not been made good as yet by any of those aspiring to it, and the past season did not help in coming to a decision. The spring came in somewhat earlier than usual; we had some very warm days in March, which started some of the varieties into growth, so that there were seen a few scattered blossoms before the month ended, which was a very unusual thing. The last of April or first of May usually arrives before we see strawberries in bloom. The month of April, on the whole, was cold, in which we had several hard frosts, viz., a very hard frost on 20th, which blackened all blossoms open at that time; Michel's and Palmer's Early were cut by this frost. Then for five or six days we had fine weather, when Palmer, Michel, Van Deman, Clyde, Excelsior, Johnson, started to bloom; the days were fine, but the nights cool, with wind in the north and west. On April 30th, had another very hard frost; many blossoms killed that were open. May opened with a freeze-up that destroyed all the blossom left by the last frost, and some buds that were not open. So hard was the frost on May the first that ice half an inch thick formed on pail of water standing outside the door.

On May 2nd and 3rd fine, with shower; plants beginning to show bloom again. The severe frosts up to and including that of May 1st seriously hurt the crop of early varieties, very much diminishing it, and causing most of the kinds to ripen together, or with very little difference as to time. Thus it was impossible to compare the varieties as to the earliness of fruiting.

On May 9th Palmer, Elba, appeared to be in full bloom; also Johnson, was well out in bloom, as also Bederwood, August Luther, Smith's Seedling, Lord Sheffield, Stone, Hero, Earliest, Michel, Excelsior, and Van Deman; others were beginning to show up well, such as Sen. Dunlap, Superior, Thompson's No. 202, Thompson's 500, Downing's Bride, Success, and Nichol's No. 6; Family Favorite, Sampson, and Great Ruby, Dewey and Tennessee, Prolific, Ruby, Hawaii, Maxwell, Enhance, J. Ruskin, Maximus, Monitor, and Woolverton; Wm. Belt, Clyde, and Bubach No. 3,298, Crescent, Miller, Haverland, Anna Kennedy, Leader, Lyon, and Nick Ohmer. It will be seen from the above that some of those that in an ordinary and normal year bloom only after the early ones are over blooming, and their fruit well set, this year were in bloom at the same time with some of the usually early varieties.

May 13th, have had about a week of fine warm weather, and might say most of the varieties are in full bloom. Some of those that were hurt most by the late frosts of April and early May are showing up well, as Palmer, Johnson, Van Deman, August Luther, Michel, Elba, Lyon, but in need of rain.

May 18th, fine thunder shower freshened up things. Most varieties of medium season in full bloom, such late varieties as Gandy, Huron, Nettie, Aroma, Timbrell No. 18, just opening.

May 27th and 28: Thunder storms and heavy rain, which soaked the ground, and was greatly needed.

May 29th: Van Deman, Michel and Texas showed the first ripe berries, with Early Beauty and Fairfield coloring; these last two were on potted plants set out last September.

May 30th: Lyon showing red, resembled the old Longfield of Dr. Stayman; the past few nights have been cool, almost frost at Jordan.

June 1st: Getting warmer; Fairfield ripe; the berry is a good size, roundish, conical, dark scarlet; plant strong; Dewey coloring; first ones on Johnson, Palmer Early; the prospects appear fine for a good crop.

June 12th: The early varieties coming to an end, as Michel, August Luther. The season lasted about four weeks; June, on the whole, was cool and moist, and thus was produced perhaps one of the largest crops of strawberries ever gathered here in Ontario. Certainly the early appearances did not promise such an immense yield.

This season has again emphasized the superiority of the narrow row system, with soil well prepared. The strawberry may be grown on any land that will produce a good crop of potatoes, turnips or corn; ground that has been well manured for roots is perhaps the best for the strawberry. They should not be planted on newly-plowed sod land, nor on ground on which the water stands after a rain, or through the winter. On the newly-plowed sod you will often find a good crop of the white grub, which will make havoc amongst your newly-set strawberry plants. I have seen the white grub clean off the plants from a two-acre field that had been planted on sod land. I believe there is no single need in fruit growing of such great importance as the careful and thorough preparation of the soil for the successful growing of the strawberry, and I believe no fruit is more unsatisfactory and unprofitable when neglected or only half cared for, and no fruit that will respond more readily than the strawberry to the proper treatment, and only those who are well acquainted with what that fruit is capable of could be made to believe that the strawberry can produce when given all the proper conditions for its best effort. The question naturally arises, What is the strawberry capable of under favorable conditions? I reply without fear of contradiction, that the grower who gives it these conditions, who does so from a knowledge of its needs, will, one year with another, clear from two hundred and twenty-five to two hundred and seventy-five dollars, after all expenses are paid, from each acre of strawberries.

The past season we may call a fairly long one, from May 28th, when Van Deman, Texas, Michel, and Early Beauty were ripe, up to July 1st, when Aroma, Nettie, Hunn and other late varieties closed the season.

On account of the hard frost we had May 1st, we did not expect any ripe berries so early.

With the above thoughts on the general conditions of the season of 1903, we may now tell how different varieties acted after the very severe ordeal they had come through. Among the new varieties of promise I may mention the Lyon, Palmer, Texas, Mrs. Fisher, Howard, Ham, and Success. Among the old varieties none did better than the Tennessee Prolific, Haverland, Clyde, Saunders; among the newer kinds Monitor again did very well; also Parson's Beauty, Joe, Buster, Irene; Splendid, an old variety, did very well.

The following new kinds have been secured for our trial plot, to fruit next year, viz.: Beaver, Climax, Cameron's Early, Commander, Early Beauty, Ernie, Fairfield, Gen. De Wett, Gersonda, Howard's No. 3, Howard's No. 7, Howard's No. 103, Jiggers, Magoon, Lucas, Oom Paul, Pocomoke, Paxton, Twentieth Century, Tilghman's Favorite, President Warren; all these have made a good growth of plant, so will be able to report on them after fruiting in 1904. I have the promise of several other new kinds, one of which is claimed to be the long-sought-for "Perfect Strawberry." It is claimed for it that it has not one weak point.

Description of varieties grown in 1903. Trial plot of Strawberry Station:

Aroma (perfect blossom): This is one of the latest; strong, healthy plant; berry, large; its lateness insures against frost; growing in favor for very late.

Auto (perfect): Originated in Delaware, and sent out by Slaymaker & Son; the plant is a good one; fair grower; the berry is large, somewhat ribbed, like Glen Mary, and fairly productive; should like to give it another year's trial before deciding as to its merits.

Armstrong (perfect): Sent to me by James Vick & Sons, Rochester; a strong grower; plant large and strong, vigorous and healthy; berry, large, somewhat irregular; red seeds imbedded in flesh; flesh white and medium in firmness, and good flavor; fairly productive; medium in season; large and fine.

Annie Laurie (perfect) : Might be taken as a standard as to quality ; plant, good grower, strong and healthy ; a shy bearer ; berry, bright scarlet, and very best quality ; not productive enough for commercial grower.

August Luther (perfect) : A good early variety ; plant, small, but good grower, and healthy ; I have not seen any rust on it as yet ; produced good crop of good berries, of nice color, scarlet, and firm, with yellow seeds ; sometimes the berry has a neck ; medium in firmness ; not quite as early as Michel this year ; was not hurt as much as Michel by the frost ; does better over a wider area than Michel.

Bubach No. 5 (imperfect) : This old standard variety did well this year ; no finer berry for size and color than Bubach ; seems to be weakening in plant ; very productive and profitable for near market.

Blonde (perfect) : Did well again this year ; plant good runner ; leaves curl up like Greenville ; makes good row berry ; bright scarlet ; medium in size ; yellow seeds ; prominent, somewhat like Nick Ohmer ; medium to soft ; flesh, pink, and good flavor, and quite productive.

Bismarck (perfect) : A seedling of Bubach ; a good, strong plant, and healthy ; berry, round and large, bright light scarlet, with yellow seeds ; in wet seasons quite light colored ; quite productive ; a good one.

Brandywine (perfect) : Did very well the past season ; a very vigorous grower and healthy plant ; berries, large to medium, dark color, firm, and quite productive ; very large calyx to the berry ; a very desirable variety.

Beder Wood (perfect) : This very valuable early variety was hurt by the late frosts, and so did not do as well as usual ; it is one of the best early varieties ; none more productive ; might be taken as standard for productiveness for early varieties.

Bush Cluster : I had two varieties sent me with this name, quite different from each other. The first variety was a good grower, healthy ; berry, bright scarlet, yellow seeds, flesh white, firm and good quality, and quite productive. The second was late, and not as valuable as No. 1 ; will give further trial ; it is evident one of these was sent out with a false name. The true bush cluster was originated, I am told, by L. Hubach, of Arkansas.

Benjamin (perfect) : Rather a weak plant ; late ; berry, large and somewhat irregular but firm and good quality ; the plant is quite productive ; one season's trial ; will give further trial.

Bennett (imperfect) : Good plant-maker, and healthy, and quite productive ; berry, conical, dark scarlet, yellow and red seeds, imbedded ; flesh, red, medium in firmness, and fair quality ; a good keeper.

Carmi Beauty (imperfect) : Plant good grower ; healthy and productive ; berry, medium in size and irregular, somewhat round, and does not ripen early ; good flavor.

Clyde (perfect) : Did very well this year ; while some object to its color, it is a great favorite in most places, many growers placing it first as a market berry ; it is very large and very productive ; when given good treatment, one of most profitable.

Challenge (perfect) : Did not do as well as last season ; the plant seemed to be hurt very much by the winter ; came out in the spring very weak, and did not make as vigorous growth as it gave promise of after the very excellent showing it made last year ; it was very disappointing this year ; will give it further trial.

Corsican (perfect) : Plant large and strong, very healthy ; fairly productive ; berry, large and good quality. It is in the same class with New York, Uncle Jim, Armstrong ; it is somewhat like Woolverton ; this is the berry sent out by Green of Rochester.

Cobden Queen (perfect) : Plant strong, healthy grower, light in color ; quite productive ; leaves curl up somewhat ; berry scarlet, with yellow and red seeds, roundish in shape, flesh pink, medium in firmness and good quality ; did well the past season.

Carri (imperfect) : Plant, healthy, good grower ; makes a good row ; not productive enough. The plant is like the Haverland ; the berry is like Haverland in shape.

not so long, but larger; good dark scarlet; medium in firmness; not so good as Haverland, its parent.

Chellie (perfect): A new one sent out by N. Barton of N. J.; plant is large, healthy; is not a great runner; makes plants sparingly; berry is large, bright, glossy scarlet; very uniform in shape, conical, quite firm; good quality and quite productive; is quite promising.

Downing's Bride, or Kitty Rice (imperfect): This variety does not do as well as in Ohio, its native place, while Mr. Crawford says it was, all things considered, the best variety he had the past season. I could not say that of it here. A good grower, the plant is somewhat tender, yet making plants freely; the berry is roundish, conical, pale in color, with yellow seeds, flesh pink, fair quality; the plant is quite productive.

Dewey (perfect): Seedling of Haverland and Parker Early; a good plant; quite productive; berry, large to medium; light red in color, red seeds; shape like Haverland; flesh pink, firm, and good quality; first fruiting; further trial.

Drought King (perfect): Good plant; berry, red, with bright green hull, flesh pink, medium in firmness; good quality; large and fairly productive; first fruiting; further trial.

Earliest (perfect): Almost identical with Michel. I can see no difference between them after another season's trial, growing side by side.

Excelsior (perfect): Good plant-maker; some rust in places; on some soils this is a good early variety; did not do so well with me as some of the other earliest, viz., Van Deman, Johnson's and Michel.

Elcho (perfect): Sent me by Jas. Vicks & Sons; good plant; good grower; dark foliage; plant healthy; berry large, scarlet, yellow seeds; flesh, white, firm and good quality; fine flavor; quite productive; berries shaped like Monitor; very promising.

Eleven-fifty-nine p.m., or Midnight (perfect): Plant healthy; good grower; only fair in productiveness; short fruit stems; bright pale pink flesh, firm and meaty; it is late, but not very desirable as a market sort.

Emperor and Empress (both perfect): Both did well with me the past season; if there is any difference it is that the Empress has most berries, and are larger; quite productive; two sorts worthy of a trial.

Epicure (perfect): Sent to me by Peter Henderson Co., of New York; the plant resembles the Gandy; berry very large; medium in firmness; scarlet, hollow, fair flavor; only fairly productive; first season's fruiting; further trial; may turn out to be Gandy.

Family Favorite (perfect): From P. Henderson & Co., of New York; good plant; very productive; medium-sized berries; good scarlet; yellow seeds; flesh white, firm; acid flavor; first fruiting; further trial.

Granville (perfect): Seedling of Miner's Prolific, sent by A. M. Nichol, of Ohio; plant, strong and good runner; healthy; berry, dark scarlet; roundish, conical, very large, flesh red; good quality; medium in productiveness; late season; first fruiting; another trial.

Glen Mary (perfect): Did very well this season; a profitable variety; plant strong, healthy and good grower, and quite productive; berry, very large, good color, somewhat irregular, with green tip; fair in quality; quite firm; a good shipper.

Greenville (imperfect): Resembles its parent, the Bubach; not so large; plant a good grower; leaves curl up some; quite productive; good color; a profitable variety for market.

Great Ruby (imperfect): Sent me by P. Henderson & Co., of New York; plant good grower, healthy; makes plants freely; berry, dark crimson, yellow seeds; flesh, red, firm, fair in quality; medium in productiveness; first fruiting; another trial.

Gandy (perfect): Some very large, fine berries, very late; a shy bearer; one of the best very late varieties.

Haverland (imperfect): One of the old standards; hard to beat; one of the very best for market growers; does well everywhere it is grown; Clyde is a good one to

fertilize it, as they bloom together ; very productive ; of large, long, bright, light scarlet berries, that look well in the basket.

Howard's No. 4 (imperfect): A seedling sent me by Mr. Howard of Massachusetts. It did very well with me this year; the plant is a good, healthy grower ; makes plants freely, and quite productive ; the berry is large, conical, very regular and uniform in shape ; it is late in season ; not yet introduced ; it is very promising.

Hawaii (perfect): Seedling of Haverland and Parker Earl ; good plant-maker, healthy and productive ; berry, scarlet color, conical, yellow seeds, flesh pink ; medium in firmness ; good quality ; first fruiting ; further trial.

Hero (perfect): Plant a vigorous grower, healthy ; rich dark green foliage ; berry, large, scarlet, with yellow seeds, medium in firmness ; fair quality ; quite productive ; did well again this year ; second fruiting.

Honest Charlie (perfect): Sent out by J. L. Farmer, of New York ; plant, large and healthy ; stools out ; good one for hill system ; quite productive ; medium in size ; will do best in hills.

Hunn (imperfect): A very late variety ; did well for it this season ; rusts very much sometimes ; berry is large, quite dark in color, with dark red seeds ; roundish, firm, and good quality ; counted one of the good extra late varieties.

Joe (perfect): Sent me by J. H. Black, of New York. Did well again this season ; a good late sort ; plant good grower, large and healthy, free from rust ; strong fruit stalks ; quite productive ; ripens with Gandy and Hunn ; I consider it a good late variety.

Jersey Queen (imperfect): Another late sort that did well the past season ; plant is small, lies flat on the ground, a free runner ; fairly productive for so late a kind ; the berry is large, roundish, like Bismarck ; light scarlet, yellow seeds, and fine flavor.

Johnson's Early (perfect): A good early variety ; did well this year ; the plant is medium in size, dark green in color, healthy, and a fair plant-maker and productive ; the berry is larger than Michel ; in color and shape resembles the old Wilson ; very favorable reports of it come wherever it is grown ; well worth a trial.

Irene (imperfect): A good plant-maker ; strong and vigorous, and healthy, and quite productive ; the berry is medium in size, scarlet in color, fairly firm, good acid flavor ; late in season ; will prove a good late variety ; worth trying.

Ideal (perfect): Plant, a good one ; healthy and good runner, and productive ; berry, very regular and uniform in shape ; conical, firm, bright scarlet ; fair quality ; fine looking.

Klondike (perfect): Plant, small but good grower ; rusts some, but quite productive ; the berry is large, softish and somewhat irregular ; did well this season ; not firm enough to ship far ; quite late.

Lovett (perfect): Did well this year ; plant, good grower, and productive ; berry resembles the Williams and Saunders ; a good sort ; some growers prefer it to either Williams or Saunders.

Lord Sheffield (perfect): A good early kind, from England ; makes plants freely ; some rust ; quite productive ; the berry is round, dark red, quite large, and good quality ; a good early.

Lady Garrison (perfect): Good plant, productive ; berry, roundish, conical, red, with red seeds imbedded ; flesh pink ; medium in firmness ; good quality ; somewhat like Monitor in shape ; one fruiting ; will give another trial.

Lester Lovett (perfect): Sent out by J. T. Lovett, of New York. I have fruited it, and I should say it was none other than the old Gandy ; I could see no difference between the two, as they grew in the same plot ; same plant, same berry, same time of fruiting.

Lyon (imperfect): One of the most valuable of the new ones I have had on trial ; very productive ; good plant-maker ; runners freely ; the berry is long, conical ; resembles very much the Longfield, sent me some years ago by the late Dr. Stayman, of Kansas ;

a bright red, flesh red, firm, flavor spicy and good ; its productiveness will make it a favorite with market growers.

Luxury (perfect) : Plant weak ; did not come through the winter well ; the berry, dark red, yellow seeds, deeply imbedded, flesh red, firm, and good quality ; medium to productiveness ; will give further trial.

Marie (imperfect) : Good plant-maker, and productive ; the berry is medium to large, round, and red clear through, with yellow seeds ; medium in firmness ; somewhat sour, but spicy ; did well again this year ; quite promising.

Margaret (perfect) : A grand berry if given proper conditions ; plant, large, strong, and healthy, and productive ; berry large and fine-looking ; one of the best, with good cultivation.

Miller (perfect) : Did not do well ; I think it may have been hurt by the late frosts ; it was very disappointing ; very few berries, and not very large ; will give it further trial

Michel (perfect) : As a very early it was not a success ; the frosts killed all the early blossoms, so that what fruit it produced came in competition with larger and finer medium sorts ; the Michel was not in it this year with them.

Monitor (perfect) : Was again a success, for second year's fruiting ; the Monitor is a valuable early medium sort ; a seedling of Crescent and Captain Jack ; the plant is small, but a vigorous grower ; dark green in color, and quite productive ; the berry is roundish, large, glossy scarlet, fine looking ; it is one of the best of the late introductions ; well worth a trial by all growers.

Mark Hannah (imperfect) : Seedling of Bubach, by M. T. Thompson, of Virginia ; plant healthy, and a good grower ; berry large, scarlet, with yellow seeds ; flesh, pink, medium firmness ; fair quality ; quite productive ; one fruiting ; further trial.

Mrs. Mark Hanna (perfect) : Seedling sent by M. T. Thompson ; good plant ; medium in productiveness ; berry large, scarlet, yellow seeds, flesh light pink ; solid ; good quality ; further trial.

Morgan's Favorite (perfect) : Good strong plant ; dark foliage ; like Woolverton ; berry, large ; scarlet seeds ; flesh, white and pink ; good quality ; quite productive ; this is, no doubt, the Woolverton, sent out as Morgan's Favorite.

Minute Man (imperfect) : Good plant ; berry, bright red, roundish, conical, yellow seeds ; flesh, white and pink ; medium in firmness, and good quality ; the berries are quite regular ; will give further trial.

Manmoth (perfect) : Strong, healthy plant ; berry dark scarlet and good size ; red seeds, flesh pink ; medium in firmness ; good quality ; one fruiting ; further trial.

New York (perfect) : Did well this year, in same class with Woolverton, Corsican, etc. ; good plant, healthy and strong ; berry, flesh white and pink ; hull dries up ; medium in firmness ; good quality ; fairly productive.

Nick Ohmer (perfect) : Was hurt by the frost ; some fine, large berries ; a good many seedy and small ; seems easily to be hurt by late frosts, even when blossom is not open at the time of the frost.

Nettie (imperfect) : Plant, strong grower ; quite productive ; very late, and quite irregular ; large to very large.

New Globe (imperfect) : Good plant ; medium productiveness ; berry, medium to large ; firm ; good quality ; late ; one fruiting ; further trial .

Nichol's No. 6 (perfect) : Seedling sent out by A. M. Nichol, of Ohio ; not yet introduced or offered for sale ; the plant is strong and healthy ; a good grower ; quite productive ; berry, dark scarlet, yellow seeds, flesh red, firm ; good flavor ; promising ; one fruiting ; further trial.

Overholt's Special (perfect) : Seedling from H. Overholt, of Jordan, Ont. ; strong, healthy plant ; good runner ; productive ; roundish in shape ; dark scarlet ; yellow seeds ; good flavor ; somewhat hurt by frost ; worth a trial.

Parson's Beauty (perfect): Did well the past season; good plant, makes runners freely; quite productive; berry large, dark scarlet, firm, conical in shape, of good quality; a little acid; like old Wilson; a very good market variety; very promising.

Pride of Cumberland (perfect): Rusted badly; had a few large, fine berries; did not do as well as usual; good grower; berry large, dark color, firm and productive.

Palmer's Early (perfect): This is a new one, and did very well with me from one fruiting; should say it was a good one; good plant; runs freely; berry, dark red; medium in firmness; good mild flavor; quite productive; one fruiting; further trial.

Ruby (perfect): Good plant; free runner; quite productive; berry roundish, conical, scarlet; large; flesh pink, firm and good quality; a good one.

Repeater (perfect): Good plant, healthy and good grower, and productive; berry large, conical, bright red, medium to soft, quality good; one fruiting; another trial.

Ryckman (perfect): A new one, sent me by G. E. Ryckman, of New York State; it was hurt very much by late frost; it was sent me as very early; the frost prevented that this year; the plant is a strong, healthy grower, making plants freely; there were a few very fine berries; one fruiting; will give further trial.

Saunders (perfect): Did well this year; one of the best sorts for the market grower; very much resembles Williams in fruit and season; the plant is larger, and does not rust as much as Williams does sometimes.

Safford or Lloyd (imperfect): Gave a good crop of fine berries; plant rusts somewhat; berry is large, dark, fine, and of good quality.

Senator Dunlap (perfect): A valuable variety; plant small, but vigorous grower, and quite productive; berry much resembles the old Wilson in shape and color; a bright dark red, red right through the berry; firm and good quality; did well the past season.

Splendid (perfect): Well named; it did splendidly this season; a first-class market variety; the plant is healthy, good, strong grower; quite productive; berry is large, round, bright scarlet, firm, and fair quality; a good pollenizer for such kinds as Bubach, Haverland, Sample, etc.

Sample (imperfect): Here is another good one; the plant is a strong, healthy grower, fine grower; quite productive; the berry is large, conical, good scarlet, firm, fine looking, and sells well; it is medium to late in season.

Shepherd (imperfect): A new one; plant good grower; makes plenty of plants; quite productive; the berry is very large; pink in color; does not color up well; fine flavor; firm for so large a berry, and quite late in season; one fruiting; will try it again.

Sutherland (imperfect): New; seedling of Burbach, by E. Sutherland, of New York; plant a good grower and productive; berry, medium to large; bright scarlet; flesh red, roundish, conical; fair quality; did well; one fruiting; further trial.

Success (perfect): Seedling from Connecticut; a good plant-maker, strong, and healthy; productive; the berry conical, bright, dark scarlet, with yellow seeds; early; berry, solid and of good quality; from one fruiting; would say it is a good one.

Superior (perfect): The plant is healthy, and good grower and quite productive; of medium to large berries; bright, dark scarlet, with red seeds; flesh white in centre, firm, and good quality, and fine flavor; one fruiting; another trial.

Sampson (perfect): Good plant; healthy and fairly productive; conical, scarlet, and with yellow seeds; flesh, white, firm and good quality; early; it was much hurt by late frost.

Tennessee Prolific (perfect): One of the best market varieties; plant, healthy and strong; vigorous grower; was amongst the best the past season; it has always done well; first season; berry, bright scarlet, large, good flavor and firm; all should grow it.

Texas (perfect): From California; new and an early variety; the plant is healthy, good strong grower; the berry is a round, bright scarlet, with yellow seeds; flesh, pink; medium in productiveness and firmness; fair quality; it does not run much; one fruiting; another trial.

Timbrell No. 18 (imperfect) : Seedling of the old Timbrell ; one of my own ; the plant is a healthy, strong grower ; productive ; the berry is large, conical, dark crimson, yellow seeds ; flesh, red clear through, firm and good quality ; very late ; a good one.

Tilghman's Favorite (perfect) : New one from Maryland ; fruited for first time from full-set plants ; the plant is strong and healthy, good grower ; the berry is large, longish, conical, firm ; flesh pink ; red seeds ; fine flavor ; cannot say as to productiveness ; is promising ; further trial.

Thompson's No. 203 (perfect) : Seedling sent me by M. T. Thompson, of Virginia ; the plant is healthy ; good runner ; medium in productiveness ; the berry is roundish ; flattened at the end ; early to ripen ; medium in firmness ; best quality for table ; one fruiting ; another trial.

Thompson's No. 500 (perfect) : Another seedling by Mr. Thompson, of Virginia ; good plant-maker ; berry dark crimson ; red seeds ; quite late ; further trial.

Timbrell (Henderson) (perfect) : This was sent to me by Peter Henderson & Co., of New York, as Timbrell, but it is nothing like the old Timbrell ; it was a pistillate, this is staminate ; this is very productive ; medium-sized berries, bright scarlet, yellow seeds ; flesh white ; medium in firmness, and only fair quality.

Van Deman (perfect) : A good extra early ; does well in most places ; did well this season ; a good plant ; the berry is a bright, glossy, dark scarlet ; firm, and best quality ; fairly productive.

Virous (perfect) : One sent me by E. J. Hull, of Pennsylvania ; a vigorous plant, and healthy ; the berry is a bright scarlet, with red seeds ; flesh pink, medium in firmness, and good quality ; one fruiting ; will try it another year.

Vandevere (perfect) : A seedling sent me from near St. Catharines ; said to be a seedling of Van Deman ; it very much resembles the Van Deman in fruit ; is not any better, I should judge, from one season's trial ; will try further.

Uncle Jim (perfect) : This is in the class of Woolverton, Armstrong, Corsican, and New York ; plant, large and healthy, and quite productive ; the berry is large, long, conical, dark red, and pink and white inside ; of fair quality ; like Woolverton, mealy ; berries light on under side ; it is a good variety of the fancy class.

Uncle Sam (perfect) : Sent out by Mr. Yonge, of Ohio ; the plant is strong, healthy grower ; good runner ; fairly productive ; the berry is a bright scarlet, with yellow seeds, pink flesh ; firm, and good quality ; one fruiting.

Wm. Belt (perfect) : Did well ; a good crop of fine berries ; the plant rusts some ; good runner and quite productive ; the berry is large, bright red, firm and good quality ; a desirable variety.

Williams (perfect) : Rusted some ; did fairly well ; had some very fine berries ; widely grown in Ontario.

Woolverton (perfect) : Belongs to the large fancy class ; plant, strong, healthy grower, and quite productive ; the berry is large or very large ; long, conical, light on under side ; flesh pink ; good quality ; mealy when ripe ; one of the best of its class.

Warfield (imperfect) : Plant, a rampant grower, but does not root deeply, and so suffers in a dry time ; did well the past season ; so well known, needs no description ; one of best for canning.

Yant (perfect) : Plant large, strong, and healthy, a good plant-maker, productive ; the berry is large, roundish, with a neck, dark red, with red and yellow seeds ; firm and good quality ; it is very promising.

The following seedlings of J. H. Black of New Jersey, fruited with me for the first time :

Almon (perfect) : Good plant, medium in productiveness, scarlet color, with red seeds ; flesh pink, hollow, medium in firmness ; good quality.

Carrie Silvels (imperfect) : A good, healthy plant, quite productive ; berry, large, roundish, bright scarlet ; yellow seeds ; hollow ; flesh red ; medium in firmness ; good quality.

Ham (perfect): A strong, healthy plant, of dark green foliage; a good runner; quite productive; the berry dark, glossy scarlet, yellow seeds; is large, sometimes like two berries grown together; the seeds prominent; medium in firmness; a good quality; a good one, I should say for one fruiting.

Howard (perfect): A good plant, quite healthy, quite productive; berry, medium to large, scarlet, with yellow seeds; pink flesh; good quality, and medium in firmness. I was favorably impressed with this variety.

Mrs. Fisher (imperfect): I was very favorable impressed with this sort. The plant is a good one, large, strong, and healthy; a good grower; the berry is large to very large; bright scarlet; flesh, pink; fair quality; medium in firmness, and quite productive; very promising.

Prof. Fisher (perfect): This is a good one also; the plant is strong and healthy, and quite productive; bright scarlet; seeds, yellow; berry sometimes doubled, like two grown together; fine flavor; medium in firmness; promising.

Leon (imperfect): Plant good grower, healthy; the berry is a scarlet, with red seeds; flesh, light pink; medium in firmness; fair in quality; longish, blunt at end; needs further trial before I express opinion.

Other seedlings I fruited are:

Own No. 2 (perfect): A good, strong plant, and quite productive; the berry is large, round, scarlet, with yellow seeds; flesh, pink; medium in firmness, and fair quality.

B. No. 3 (perfect): Plant, good grower, healthy; dark green foliage; quite productive of good-sized berries; the berry is dark scarlet, with yellow seeds; medium in firmness; good quality; a good market variety.

No. 403 (perfect): A good plant, and productive; berry, medium to large in size; conical; good, scarlet, with yellow seeds; flesh, pink; medium in firmness, and of good quality; a very promising one.

List for Growers and Seasons of Fruiting.

Early and Extra Early Varieties: Van Deman, Texas, Vandevere, Michel, August Luther, Palmer, Monitor, Johnston, Excelsior, Smith, Success, Lord Sheffield, Bederwood, Clyde, Sampson.

Mid Season to Late: Haverland, Lyon, Splendid, Bubach, Tennessee Prolific, Honest, Charlie, Marie, Bismark, Ruby, Glen Mary, Saunders, Sample, Williams Lovett; Senator Dunlap; Brandywine, Nick Ohmer, Emperor.

Late to Extra Late: Aroma, Gandy, Klondike, Joe, Nettie, Robbie, Lester Lovett, Midnight, Timbrell No. 18.

The above is a list of the best varieties as proved by trial over an extended area. Growers cannot go wrong in choosing from the above list for trial on their own grounds.

Charles Young (Algoma Station).

Strawberries have simply been a tremendous crop. I am gradually increasing the patch each year. We plant just more than we think can be disposed of in our local market, but at picking time find the demand far exceeds the supply. One quart to the bush was gathered last season from what I would call standard berries. Williams and Saunders I will discard altogether; the same may be said of Greens' big berry; it certainly is a big berry, but with me it begins to rot before it is ripe. Clyde, which in former years did so well, came in second this year. I allowed too many runners to set. Haverland did best; the pickers like them; they are easily hulled, and though lacking in color as individual berries, have a fine appearance in the box. In our local market here they all sold at 10c a box. The season lasted a little over a month. This was by far the best paying crop I raised in 1903, and about the only trouble was in getting pickers.

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